## COMPUT **TERWORLD**

#### INSIDE

Spotlight -Battening down the hatches. Pullout section on disaster prevention and recovery follows page 58.

In Depth - Making yesterday's data good as gold. Page 55.

Claris buys Nashoba Systems, a supplier of file management software. Page 8.

NCR readying bridge to 9800 architecture for V series users, Page 16.

Standing pat with AT&T, Sun, plug-compatible mainframe vendors shy away from the OSF for now.

Passt! Want a good deal on PCs? Toss out that list. Page 97.

OSI deadline for U.S. agencies is only two years away, but it will take at least that long for commercial products to be readily available to convert TCP/IP networks. Page 6.

ADR's Rescue por as alternative to ESA in new release. Page 4.

Latest PS/2 models catch attention of busi buyers. Page 33.

## PC DBMS fracas set to erupt

BY DOUGLAS BARNEY

Esber has called it war. Others rrely expect chaos. No matter how you describe

petition, all because of a diazying array of new prod This brutal competition, ex

ected to reach a cres sometime next year, may man the first real threat to Ashtor Tate's coveted lock on the man

than a dozen large users and in-dustry observers indicate only ne clear winner in the comin sta base showdown — SQI ven data base servers. ce all key PC DBMS ver and an any PL DRMS vendors apport or plan to support SQL and the so-called client/server sodel — in which the server andies the processing and the curkstation handles the inter-

Going's cill hore
A quick rundown of the coming
products, none of which has
shipped but all of which support
SQL, includes IBM's OS/2 Extended Edition, Ashton-The's
Disse I'V and SQL Server, which
is being jointly marketed by Micronoft Corp., Sybase, Inc. and
Ashton-Thes.

crount Corp., Sybene, Inc. and Authon-Tine.

In addition, there are Lotus Development Corp. 'a Lotus,' DBMS, Oracle Corp. 'a Corp

vice-president within the corpo-rate banking sector workstation project at Manufacturers Hano-ver Trust Co.

That outlook foreshadows a

### IBM pilot may signal net plans

BY ELISABETH HORWITT

Corp. are prepari ment advanced n

cipal vendors in the renovat of the National Science Form tion's network, NSFnet, wh connects researchers and sci

resources at the foundation's 15 Supercomputing Centers.

Phase 1 of the project, which became operational hast week, replaced the old 56% bridges. NSFnet with a 1.5M bit/sec. NSFnet with a 1.5M bit/sec. MCI Till lines and packet switches that IBM de-signed for the project. In the next place, IBM and MCI will extensive to this all of the

MCI will attempt to us as or metwork components into the centralized Network Operations Center, which is run by Ann Arbor. Mich.-based Merit, inc. This move should enable trafficiants, outages and other problems, outages and other problems.

Dynamic reconfiguration of bandwidth is a crucial new fea-ture for NSFnet "so that if links

shton-Tate Corp. Chairman Ed

MECENT OF STREET

it, the personal computer data base management system mar-ket is heading for a new level of Shifting currents ton-Tate's dominance in PC data base management system ing, and opportunity is rising for a multitude of competitors

#### Doubts on Aegis use in Gulf Iran Airbus seen as victim of too much technology

BY IEAN S. BOZMAN

WASHINGTON, D.C. - The investigation of the destruction of an Iranian Airbus jet one week ago by the U.S.S. Vincennes has called into question the suitability of the highly computerized ose quarters of the Persian

The Aegis system, designed as a total weapon system work-ing from detection to kill, ing from detection to kill, tracked the passenger jet shortly after takeoff and guided two mis-siles to it, at least one of which knocked it out of the sky and ap-parently killed all 290 passen-gers and crew members aboard. The incident has raised a host of

one about the

DIR

reliability of the ship defense system, touted by the Navy as "the most capable surface-launched missile system the Navy has ever put to sea."

Navy has ever put to sea.

"The computer can't solve anything if it doesn't have high-

## Now, whose desk do we put it on?

BY JULIE PITTA

he first personal computer ever machine france he first personal computer ever made has found sow home at the Smithnost an Institution in Washington, D.C. The 34-year-old G15 FC bears little resemblance to the micros of today. For starters, it is nearly the size of a refrigerator. And whereas today you can buy an IBM Fersonal Computer clone for as little as \$300, the G15

was a major investment at a price of al

\$50,000.
"Whether it as PC or not is a matter of argument," says Harry D. Huskey, the G15'a designer. "It depends on your definition."
However, the G15 was designed for a single user. It contains 250 vacuum tubes, requires

Designer Huskey at the G15

306 H ZEEB RD ANN ARBOR SECOND CLASS MAIL

CH 06978416 203010227F71

MI 48186

UNIVERSITY HICKOFILMS SERIAL PUBLICATIONS

#### IN THIS ISSUE

Roscoe to the rescue. Applied Data Research's programming environment now gives IBM MVS/XA users the reduced I/O of

MVS/ESA without upgrading. Page 4.

3Com comes on. The latest 3+ operating system allows for the use of Intel 80286- and 80386-based PCs as file servers while running a network of Macintoshes and other PCs. Page 14.

> dging systems disaster. me home 58

NETWORKING

stances muddy the road from TCP/IP to OSL 43 Everything you've ever wanted to know about buying T1 multiplexers.

43 Teleos system sup-ports ISDN Basic, Primary Rate Interfaces.

SYSTEMS & PERIPHERALS

49 Stock market comput

49 Fujitsu adds three batters to its Pick lineup.

49 Arix 800 will quote stocks under Standard & Poor's label.

MANAGEMENT

59 Langridge's molecular

models are certainly not just

Quotable

gone past the 'gee-

whiz' phase of desktop

publishing, and now

it's time to wake up

and face the morning after.

he honeymoo

is oper. We've

ers' futures looking up.

43 Rival DOD, ISO

4 Apollo's million-dollar loss floors stock prices, stumps analysts, 5 Phoenix-DEC pact may out MS-DOS simulation in

personal VAX. 5 Perot's Postal Service

6 Government contractors see rocky road ahead for OSI

8 Corporations increasing-ly put mainframes to work on electronic publishing. 8 Desktop publishing is slowly floating into the main

10 HP knuckles under to DRAM inflation, hikes board prices up to 25%.

10 Boards are falling vic-tim to profiteering DRAM 14 NEC and Hitachi pro

duce AS/400 rivals but won't let U.S. have them. 15 Firm scoops IBM with distributed data base soft-

16 NCR transaction processors will provide smooth upgrade to high-end boxes. 97 PC buyers take note: Discount days are here.

#### SOFTWARE &

23 Barry Controls adopts packaged software into its homegrown family.

23 Mathstation will handle nesty calculations with work-station speed.

23 Prime's 50 series superminis will run Univ

#### MICROCOMPUTING

33 Bright new PS/2 models bedazzle potential buyers. 33 Swarms of software vendors dive through Microsoft's Windows.

#### COMPUTER INDUSTRY

67 Tandem's CEO kicks back and reflects on the Un-germann-Bass buy-out. 67 Cherney does encore

re-enters computer leasing scene 67 National Semiconduc-tor's returns belie analysts'

rosier predictions. 67 IBM's VM operating system wakes up and gets no-

COMPUTER CAREERS 77 Demand for contingen-cy planners mounts in wake of

TRENDS 98 Reel-to-reel dom

come on. SPOTLIGHT

uarding systems in an e world wa poge 58.

IN DEPTH 55 A way to give end us-

#### ers the ultimate in data access and data purity. By Ken OPINION &

19 Lecht says the media is the new message for high-tech firms.

59 Devouring new tech-nology, DP shops go on hiring 23 Bogert's guide to effi-cient program modification.

33 Barney thinks Micro-soft got a bit cheesy with GW

43 Keefe's inquiring mind wants to know: Will Banyan support the OSF? 49 Gibson spots trend in IBM's Total System Package.

59 Gilliam spits in the eye of the Executive Fear Factor. 67 Zachmann refuses to kowtow to exalted AS/400.

DEPARTMENTS

RICK YOUNG DATAQUEST, INC. See aftery page 8.

#### 18 Editorial

65 Calendar 88 Marketplace

98 Inside Lines

## Fuse fizz quells bells

Outage leaves 35,000 phoneless west of Boston

#### BY JAMES DALY

FRAMINGHAM, Mass. - A FRAMINGHAM, Mass. — A power loss in a telecomessication switching office just minutes before the worksigh segar juried bosiness schedules and left local subnoines siving on a feel local subnoines siving on a feel local subnoines in several mobertam towns west of Boston last week. Roughly 35,000 customers in Framispham, Marchron, Mildred and Sudieury lost phone service which a feet level of 545 zm. Telephone central office switching until, company spokeswomen.

Clare Sävestri mid.

"The electricity was restored fairly quickly, but when the power went out of the computerised switch, a lot of reprogramming had to be done," Sävestri mid.

Telephone capabilities were restored in fits and starts throughout the day as the reprogramming progressed, and service, was fully restored to the saves by 70 on.

BY J. A. SAVAGE

erating system.

Amdahl Corp. and Na

Advanced Systems (NAS), the two leading PCMs, both back AT&T's Unix. More specifically NAS backs Sun Microsystems. Inc. a version of Unix, which in

In the meantime, local au-thorities and many businesses thorities and many bisanesses took precautionary measures. New England Telephone provid-ed portable cellular telephones to-police, fire stations and local hospitals and dozens of emer-

Benker's hours
Framingham police also advised
banks to close for the day as a
safeguard against robbery, since
many of the alarm systems are
stand standard by the telephone lines.

many of the alarm systems are tited stoto the telephone lines. Although it was inconvenient, the incident pales when compared with the disruption caused by a recent fire in a switching by a recent fire in a switching. ICVM, May 16].

The May 8 fer in a Handalu, III, contrat telephone office and switching station of Blinois Bed destroyed more than 150,000 long-distance, data and local long-distance, data and local voice lines and cruppled teleconvoice lines and cruppled telecon-term Blinois.

#### PCMs cool toward **OSF plan**

operating system. If this were the case, both companies would be able to port AIX with their current "M-compatible re-leases. Both said they expect AIX to ship in spring 1989. The question of which stan-dard to support is a problem for NAS, a subsidiary of National Semiconductor Corp.: The parniconductor Corp.: The par While IBM plug-competible manufacturers (PCM) monitor IBM henricher with the precision of an electrocartifograph, when it comes to the Open Software Foundation (DSF), the doctor is out pluying and ... Challenging the ... Tall-demond Ubin Opensing system. Company of the Corp. and others two mouths ago in an effort to establish another open Units or Units-like opensing system.

controlled to the controlled t

HE QUESTION of which standard to support is a problem for NAS: Its parent company's largest customers are being represented by the OSF.

would be two years late," said David Holt, director of NAS's Unix development. NAS said it expects to have the operating system available this fall. Amdahl, which has its own version of ATAT's Unix -- UTS

is taking a more continue ap-proach. "We're going for the largest open standard available, and that's AT&T's Unit," said

Inc.'s wration of Unit., which includes some University of Colifornia at Berheley Unit traits. Neither FCM has committed to opposing the OSP; both aid they will be able to support a new IBM standard with the computers: they currently make. While they are monitoring the OSP's progress, there seems to be an need to lower over the patient. The FCMs reportedly expect. BM's high-end Unit: retense, called AGL, for number its yIM. COMPUTERWORLD

JULY 11, 1988



# THIS GIVES YOU A ROUGH IDEA OF HOW FAST OUR SOFTWARE IS.

It's only a rough idea, granted.

But then, how do we convey the speed of our products? Software that can dramatically reduce the use of your computer resources: CPU Time, SIOs and the like. Typically, by as much as 50%. Frequently, even more.

And that not only goes for our sorts, but for all our products.

But there's really only one way to get more than a rough idea of how fast our software is: try it yourself. To arrange for a test on your system, call **201-930-8200**.

We'll whoosh right over.



or application each time that it was needed, which created re-petitive I/Os for Kobacker's IBM

petitive I/Os for Kobacker a sp-3090 Model 180 mainframe, be

ers an estimated 39% impro-

programmers. Developers can

York, said an application devel-oper can do the same things un-der IBM's TSO/ISPF.

However, Holohan added, oscoe is "less of a resource hog

## ADR offers alternative to ESA

Roscoe reduces I/O, provides caching facility while eliminating upgrade

BY CHARLES BABCOCK

PRINCETON, N.J. - Appli Data Research, Inc. (ADR) re-cently said it will give IBM main me users an alternative to ving to IBM's MVS/ESA oprating system by offering a pro-ramming environment that rovides one of the major bene-ts of ESA without requiring an

upgrade.

A new release of ADR's Ros-coe gives IBM MVS/XA cus-tomers the benefit of reduced I/O without forcing an upgrade to MVS/ESA and the TSO facility designed to work with it — IBM's Virtual Lookaside Facili-ty, which is due out in the fourth

or yourser.

According to ADR officials.

According facility that was added to Release 5.6 of Roscoe is comparable to the Lookaside Facility and can store the elements in Roscoe's library in virtual

The cache makes use of what add to be underutilized virtual emory above the 16M-byte ad-tess line of MVS/XA. The ele-Whose desk?

30A to 40A of power and uses a rotating magnetic drum for storage — the procursor to today a

ments stored in cache are availble as if they resided in the CPU'a main memory.

Roscoe puts into cache the ogram elements that are fre-ently used or needed by multi-

ADR's Richard Specht said the I/O reduction represents 39% of total I/Os without the caching, with a comparable performance increase — a claim supported by an early Roscoe

Foncy footwork Dave Simkins, systems pro-grammer at Kobacker Co., a na-tional retailer that sells shoes rough the Pickway

nbus, Ohio-based firm uses stines written in the Roscoe programming language, called RPF, to let its buyers and merants create reports and aga-

"The caching facility has ben-efited us greatly because we are an RPF-bound shop," Simkins

Without the caching, an RPF routine had to be called by a user

han TSO."
TSO requires each user to ave an individual address space, sting up resources in the system, while all Roscoe users operate within one address space,

"When we measured TSO, we found one TSO user takes up 5% to 2% of the CPU. Under ple using 10% to 15% of the CPU," he said.

Although Kobacker has not measured Release 5.6 against 5.5, Simkins said, "Seen by the Fifteen years ago, Roscoe was one of several competitors to IBM's teleprocessing monitors. Today, it is almost the only naked eye, the response time is a lot quicker." He said be considsurvivor among the group, which succumbed to IBM's CICS, IMS/DC and TSO. ADR maintains 1,806 active Roscoe Release 5.6 also provides IBM DB2 application develop-ment facilities for Cobol and PL/I

programmers. Developers can dynamically execute SQL com-mands, bind application plans and process DB2 commands from within Roscoe. Developers An application programming interface that gives users of SAS Institute, Inc. a SAS System, In-formation Builders, Inc. a Focus or Application Development Systems, Inc. a Xpediter access to Roscoc'a editing and RPF panels from within their applicaare able to interactively execute DB2 applications within Roscoe as well, ADR's Specht said. Resource hog
John K. Holohan, manager of the
data base administration group
at Mercantile Stores Co. in New

Additional data set facility functions that allow users to compress partitioned data sets.
 User interface enhancements

n in West Germ ed largely from Siem surchases of substanti

ent with the Europ

agroement with the European electronics giant.

"Apollo is trying to sell a ward-tyl of good products in a booming market, and they should be able to do it." and Berry Bonsie. As the sell to do to it. and Berry Bonsie. In. the Vott. The West German problem, he mid. "could have been officed if goo U.S. after the ward of the ward

sak added.

While the had news from the balance sheet is largely rooted in problems particular to Apollo. Crabs said, it could size contain a warning to the workstation mar-let at large.

"Most people's growth esti-

"Most people's growth esti-mates for Apollo and the whole market were a bit overenthusi-astic," Crabs said.

Apollo said it expects to re-

port revenue of approximately \$145 million for the quarter end-

ed July 2, a 10% jump from last year's comparable period. It said it will formally announce its sec-ond-quarter exmines later this

COMPETERWOOD IN

Bill Labora Sentitro Editor Pará Gillin

Graphic Design

Weskington, D.C. 200/347-0718

d Butto, Correc

s S. Borman, Corner

IDO House Serties atkines A. Gev. David

#### Apollo stock plummets following loss forecast

BY NELL MARGOLIS

CHELMSFORD, Mass. - Apollo Computer, Inc.'s amounte-ment of an impending \$5 million to \$8 million second-quarter loss sent stock prices plansmeting and analysts racing to erase for-merly upbeat estimates late last

week,
"It was clearly a big surprise
— to the Street and to the com-pany," said Gary Smaby, an ana-lyst at Needham & Co. in Minne-

"I knew there was exposure this quarter, largely because of [Apolio\*s] by price cuts earlier this year," said Rushell Crabs, an analyst at Gertner Securities Corp. in Stamford, Com. "But I never thought there'd he any-thing like this. Face it. This was a wave work cuarter." "I knew there was exp

thing me the way, very very very weak quarter."

Apolio attributed the loss, which contrasts with net income of \$7.6 million in the company's fiscal 1987 second quarter, to two factors: a falloff in demand

for current products from cusfor current products week's an-nouncement of an Apollo work-station line and to "the failure of our German subsidiary to meet

the G15 into production. Like the PC of today, the G15 was designed to perform as a stand-alone unit. But that's where the

Many of the PCs Bendix built in 1954 were sold to chemical and oil companies, which used them for engineering computa-tions. With their hefty price tags,

age — the precurace to today's dark drives.
While the awarge PC today can store more than 500K bytes of information in memory, the G15 can store more only 12K bytes, the equivalent of 3,000 numbers. It also licks an operating system. Hankey had to design his own programming language, called intercon, since none existence of at the time he designed the G15. Information was fed through somehoner tano. Manifest destiny Building the G15 was no fluke for Huskey. He worked on a number of computer projects, including the development of the first ges-

eral-purpose electronic comput-er — the Electronic Numeric In-tegrator and Calculator, or ENIAC — as part of a University A crate carying the G15 PC as shipped from storage in a simple from storage in a irin in Santa Cruz, Calif., to tashington last week.

The Smithsonian became of Pennsylvania research project from 1944 to 1946. Parts of that uter are also on display at The Smithsonian became vare of the G15's existence

The predecessor to the mod-ern mainframe used 18,000 vac-uum tubes, 250 kW of power and aware of the G15's ensitence when Huskey, professor emeri-ture at the Computer Science De-partment at the University of California at Senta Crue spoke at the Boston Computer Museum nearly two years ago. The muse-um also has a G15 in its collecrequired a room 30- by 60-ft in

by putting jumper connections on the front panel," Huskey re-calls. "It took a crew of five or six people two to three days to get a ram onto a computer." laskey, who is 71, has lived

long enough to see com gain wide acceptance. He is per-ticularly surprised at the phenomenal success of PCs.
"I can't believe how pervasive they are these days," He key says. "It seems everyor

tion. A life-long academician, Hus-key designed the PC in his spare time while serving as a professor at the University of California at Berkeley in the early '50s. He inter slidt the design to the Com-puter Division of Bendix Avia-tion Corp., where he monoliphed as a consultant for the PC oject. It took Bendix a year to get

### **Deal hints at personal VAX**

BY STANLEY GIBSON

In an apparent foreshadowing of the in-troduction of Digital Equipment Corp.'s so-called "PVAX," or Personal VAX, Phoenix Technologies, Ltd. has signed a

ment with DEC.

Phoenix, based in Norwood, Mass, provides BIOS systems software to makers of IBM Personal Computer closes.
The agreement states that Phoenix will provide "customized versions of a variety of its systems software comp products for DEC'a VAX family."

Several sources indicated it is likely that DEC will use Phoenin's software emulation of Microsoft Corp.'s MS-DOS operating system in the PVAX. Thus the PVAX, a single-user desktop muchine that will reportedly run DEC '97MS operating system, will not include a hardware DOS coprocessing.

Foll evenlebility?
Opinions differed on when the PVAX will be formally announced. Predictions ranged from before the upcoming Deworld in September to the Digital Equipment Computer Users Society, or DECUS, meeting in late fall.

ent was part of a prepared announce-nt of the agreement insued by Phoenix. DEC currently offers no VAX/VMS stems that run MS-DOS in emulation, ted Stephen Widen, a DEC annalyst at search firm International Data Corp. in anningham, Mass. The announcement

Phoenix can provide the entire DO: environment on a couple of floppy disk rather than on a coprocessor board, Phoenix spokesman said. He said Apoli

tion.

"DEC's final strategy is to put a VAX on everyone's desk and let it run DOS actoftware for people who want to run that. If it could be a \$5,000 ber and run VAX. DOS and OS/C, then that woods be a potent competitor," said DEC observer Terry Shannon at CLS, Inc., a VASS software house in Braintree, Mass.

#### Perot's Postal Service contract stalled by GSA

WASHINGTON, D.C. — The simmering dispute between Electronic Data Systems Corp. (EDS) and its founder, H. Ross Perot, boiled over last week with a federal agency's suspension of a controversial U.S. Postal Service no-bid contract award

U.S. Postal Service no-bid contract award to Pere's new firm.

The General Services Administration (GSA) Board of Contract Appeals may pended Pere's Systems Corp's contract to do a 90-day, 4500,000 study of Postal Service efficiency, Under a second phase of the contract, Pere's Systems was to tiestify and belp implement savings for the Postal Service over a 10-year period and share is a portion of the surines. the Postal Service over a 10-year period and share in a portion of the savings. Postmaster General Authony Frank asked the U.S. Court of Appeals for the Pederal Circuit to overrule the GSA board on the grounds that the GSA lacks juris-diction over the Postal Service.

sking changes wever, Frank acknowledged that the stal Service will have to modify the sec-led phase in order to answer concerns sed by congressional critics who fear it dd result in exceptionally high profits

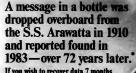
The board upheld the protest of Wa gton-based consulting firm Planni search Corp. and EDS, the compu services company that Perot founder sold to General Motors Corp. in 1984 an left in 1986 with a three-year noncomp

on agreement.

The ruling effectively stops work and yment on the first phase pending a full aring by the GSA board next month.

wearns note offered
An EDS spokeswoman said the company
filed its protest because it believes the
contract, particularly the second phase,
should be subject to competitive bids. She
said EDS was not singling out Perot, noting that "we would do this with any competitior on contracts that we might want
tobid on."

to bid on."
Perot's agreement with GM bars him
from earning a profit with his new company before the end of 1989.
He was quoted last week as saying be
now will conspete directly with EDS for
commercial contracts because he has
been kicked around by EDS.



If you wish to recover data 7 months or 72 years from now...let Innovation show you a much better way.

The better way is ABR—the DASD
Management component of FDR, submates
the backup of your disk volumes. Data sets are automatically
backed up when padated. At some interval (usually once a week)
backed up when padated. At some interval (usually once a week)
volumes from current or older backups. TSO/ISFF panels give the end user
volumes from current or older backups. TSO/ISFF panels give the end user
any access to the DASD Management reports and backuprestore functions

So, if retrieving messages from a bottle won't work for you...call Innovation and we'll send you a Free No Obligation 90 Day Trial of a system that will... and you will receive Free, the deluxe 1987 Guinness Book of World Records.







IBM, OS, VS1, MVS and MVS/XA

MOVATION DATA PROCESSING

Plaza, 275 Paterson Ave., Little Falls, NJ 07424 • (201) 890-7300

### All dressed for OSI. but no way to get there

BY ELISABETH HORWITT

With the U.S. government set to impose on itself a two-year dead-line to begin implementing Open Systems Interconnect (OSI), U.S. spencies — and businesses that depend on government contracts — are facing a dearth of cts to ease migration from

The big gaps are lack of OSI support by some major comput-er vendors and a shortage of gateways allowing OSI and Transmission Control Protocol/ Internet Protocol (TCP/IP) net-

the transition period.

In the next mouth or two, the
U.S. government and Department of Defense are slated to release mandatory guidelines for
their agencies to begin migrating from TCP/IP, a de facto
networking standard widely

donarractors.

"Once the government gets standards in place, it will imme them on contractors like," and Wayne Hannah, directors and wayne Han

Anticipating that scenario, the U.S. Air Force contractor already begun implementing "more mature" OSI proto such as the X.400 electrons

dors every way we can to get on the OSI bandwagon," Hannah

It should take from two to five sars for a full set of mature. ed, commercial OSI prodtested, commercial USI prod-ucts to appear, Hannah said. This is the main reason why the soon-to-be-released Govern-ment OSI Protocol (GOSIP) plan and DOD OSI Implementation grace period in which agencies

can buy either type of network, be added. After that, the agen-cies must specify OSI in all recuests for proposals for comations systems. "But even if someone came to

us now with a full set of mature OSI products, we would not throw our existing networks out the door" without allowing them to depreciate fully, Hannah said. McDonnell Aircraft also lacks the capital to buy a new network

Not plunging yet Northrop Corp., another Air Force shop, is trying to figure

out how to implement the indus-try networking standard on a group of hosts that currently use TCP/IP to communicate, said gineer at the firm. But Northrop of its older, proven networks

state-of-the-art technology but has also drawn much criticism of At the heart of the \$525 mil-

lion Aegis system is a highly so-phisticated radar, the AN/Spy-1, designed to track more than 100 targets at once under nevere The radar is linked to a com

puterized firing system, which stores profiles of aircraft, match-es them with radar signals and controls the firing of missiles. ce an aircraft is determ be hostile, the system, either automatically or under operator control, directs a Standard-2 mefium-range missile at the target, outhing it in electrons on which

the missile homes in.
Although the military will not reveal classified details, military reference sources describe Aegis as controlled by three clusters of four AN/UYK-7 computsystems that direct

functions automatically.

The system, which the Navy claims allows battle coordinators "to manage rather than react to a difficult situation," detects and tracks targets, distributes data for target evaluation and designation, integrates radar and other information sources in the while it tests the functionality of newly released OSI protocols — and while it waits for certain unsputer vendors to annous full support of the standa Mandii said.

Gateways would have helped the University of Illinois' MIS in its recent efforts to tie together TCP/IP and Digital Equip Corp. Decnet user sites, according to Virginia Metze, mana of the university's Materials Re-search Laboratory Center for

Instead, the organization at the university, which is a DOD and National Science Foundation (NSF) contractor, had to make do with Proteon. Inc. routers that allow devices running en protocol to coexist on the say Ethernet network. The labor tory's DEC machines still have to run TCP in order to con

cate with other parts of the un Metre said she hopes gate ways will be available to link th new networking protocols to all of the university's systems.

Not all agencies are blindly following the government's mioliovas — gration path, however. The No-supports the GOSIP transition plan, "but there are lots of ways to implement OSI," said Steven

fold, director of networking. Try before you buy NSFnet, a TCP/IP-based network linking NSF sites and cor puter centers nationwide, Inst week began using a backbone

that provides routing for both TCP/IP and OSI transmissions.

'It is an extremely sophisticated system that has as its pri-mary goal preventing U.S. ships from being blown out of the wa-ter," Howard said.

First deployed in 1983, the Ae-gis system has received mixed reviews from military cons

tants and some critics in Congress. The General Accounting tem's testing phase that the tests were not comprehensive enough to ensure its reliability. enough to ensure its remains.

More recently, it has been criti-cized as inappropriate for use in the narrow confines of the Per-sian Gulf, where the Airbus was

said. "In the ocean, you have a measure of time to define your ms and to work out a rea-

ship—refies on the initial quality of the data entering the system. But in an attack, managers, lack the time to check on the data's reliability, Carroll and The Vincenses: "only had four minutes to weigh conflicting evidence," he said. The plane was abot down while flying sine miles from the Vincenses.

In the July 3 shooting, an onessue have over the Presion consult have over the Presion consults.

NSF migration strategy, which will allow users to try out the new OSI applications on top of their existing TCP/IP networks

ping the two types of net-rks pure and separate, linking

n seas as the contracts nice you," Carroll continu

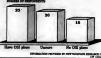
At sea, you're operating with copic who are less well-trained han the contractors' lab people

Vendors are just starting to meet — and argue — about what should go into a future gateway standard, industry

sources said.

During this period of debate
and delay, government and defense contractors are either putting off their Old implementation plans or making do with
what is currently available. Nor-

Divided loyalties
A survey of 58 TCP/IP users found that the majority have no plans
to microtic to OSI or are succertain



them by means of gateways.

"We do see the need for gateways.— I get my X-400 mail from Europe translated into Europe translated into Europe translated into Europe in Europe in Europe and Europe and Europe in Europe throp, for example, is consider-ing connecting OSI and TCP/IP

ing connecting OSI and TCP/IP systems via computers that support both protocols. McDonell aircraft has been 
concentrating on providing a 
connection between users of the 
OSI X.400 E-mail protocol and 
BBM, DBC and TCP/IP E-mail 
users. DBC's Mailban reportedly 
provides inits both to X.400 BM's 
Professional Office Systems 
hetter funers as Pro
serve better funers as Pron, better known as Profe wever, a link to the TCP/I E-mail protocol is still unar able, Hannah said.

with the Iranian plane. The ship's system showed that the oncoming plane was descending from 9,000 fact and moving as quickly as 540 miles per hour, top speed for an Airbus.

than the contractors' lab people are, and you're operating with ships raining and failing." Ultimately, all high-tech weapons systems will be judged by the feedback they give to their human operators, usid Brian McCartan, a senior analyst at the Center for Defense Informs-12,000 feet when hit and that it was either ministaining fax course or ascending at the time. Because of innited resources, there was no American Automatic Warning and Control System, or AWACS, radar plane to verify the Vinceward identification on attack plane, Howard and .

Measuwhile, the shape radar acreemes qualet on distinguish because it is not to be a support of the country of the count the Center for Defense Informa-tion. "The complexity of such systems, especially Str War-systems, and even the explored of MASA's Challenger, will be cited as evidence that these sys-tems are just too complicated and too imperfect to give the computer the power to take con-trol, "he said.

Meanwhile, the step a remarkers could not distinguish be-tween the 177-foot Airbus and the 62-foot F-14 fighter plane the 63-foot F-14 fighter plane the Vincenser crew reportedly believed it was firing at. "In or-der to make a big twice as long as another, the accord object would have to be about 16 times a large," McCartan siel. Even thought the Aegis sys-tem is capable of automatically deciding to shoot down a sarget, Vincensee Capt. Will C. Rogers III made the final decision to about down the Irration plane. Washington correspondence or

## Aégis FROM PAGE 1

quality information to begin with," said retired Adm, Eugene Carroll, deputy director of the nonprofit Center for Defense In-formation. In the Gulf, Carroll formation. In the Gulf, Carroll said, "you don't have enough time to correlate the data from the radar and the electronic sea-sors." The center is a nonprofit organization that provides an ai-ternative source of defense and

ternative source of defense and military analysis. After two briefings by Ansistant Secretary of Defense J. Daniel Boward ant week, there two briefings of the source of t

The defense system, de

The occurse system, or-signed to protect against potent antiship missile systems such as the Exocet missile that de-stroyed the UK's HMS Shaffield during the 1982 Falkland Islands

"Aegs was designed to sup-ort a war in the open ses, with arge amounts of water and air pace around the ship," Carroll

you are tracking. "The problem "The problem is that it's nev-er done nearly as well on the

## VMCENTER II Smart Economics.



At Nielsen Media Research, the top-rated program isn't on the air.

It's on the gystem. And it's VMCENTER II. The MCENTER III is the most powerful, comprehensive systems management to low anishable for VM users. It's also a key factor in Nicken's consistent ability to deliver the ceiline ratings information the television industry depends on VMCENTER II to keep operations running smoothly while making the most of data processing resources.

CHITCAL FUNCTIONALITY FLUS LASTER CLASSFEARCHS. With customers dialing into the system daily, reliability is crucial for Nielson. YMCEVTER IT is unsurpassed backup and recovery facilities have virtually eliminated this source of concern. At the same time, other YMCOVTER Is lacilities are saving DASD, simplifying schoduling, reducing manual later to an experiment ducing manual later, yMCOVTER II. Expansily important, YMCOVTER II. Expansily important, YMCOVTER III.

1-CWX-880711

has made it easier than ever to track individual project costs within data processing. Results: More costeffective operations. More accurate project billing. And more satisfied

VINCENTER II. THE VIN SYSTEMS MANAGEMENT YOU

This record is impressive. But it's only the beginning. With its broad capability and proven time saving features, VMCENTER II is the single most important tool available for all your VM systems—from 9370 to 3090 to whatever the future may

oring.

So why delay? Get VMCENTER II today. And get set for some of the best programming you'll ever see. For more information, write or call:

800-562-7100 703-264-8000

VM Software, Inc. 1800 Alexander Bell Drive Reston, Virginia 22091



The VM Experts

## The mainframe print shop

#### BY CHARLES BABCOCK

en Connecticut Mutual Alliance informed its customers it was making a special life insur-ance offer, many took the com-pany up on it, and thousands of

quickly.

Until recently, the offer would have led to the hiring of 30 people, who would type up policy information on preprinted forms and then assemble by hand the 25 to 30 pages that make up a policy. This time, however, no extra staff was hired and on preprinted forms were drawn from

Instead, forms that reside in-side a mainframe publishing sys-tem were tapped and adjusted to

effect various state regulations.

The policies were bound from
the nide rather than the top, altowing the contract to be opened and rend more easily. And while the typical policy had previously relied on a set of endorsements that referred back into the text that referred back into the text of a standard-issue policy, the newly issued documents

"A few of the olde

ere so used to the other way of ng things that they said it ed like we had gone downhill a bit. But we feel we've gained an edge on the competition," said Ralph E. Sherman, data process

The big picture Dedicated mainframe publishing systems are expected to climb 25% annually through 1992 while industry revenue gross at 7.5%

MINER OF NEW U.S. LECENSES



Express Co. started electronical-ly printing reduced copies of cus-tomer's credit card slips on a sin-

licy printing at the Hartford, Conn., company.

Among a handful of compr

nies, electronic publishing — mainframe-style — is viewed as a source of competitive advan-tage and a new role for the cor-porate MIS department. With officer in charge of automat corporations devoting 4% to 6% of their gross reveaue to docu-ment printing, mainframe pubment printing, maintrame pub-lishing offers the potential of scaling back or eliminating in-house print shops, said Tony Deakins, vice-president of Aux-ton Computer Enterprises, Inc. or Auxo, an Orlando, Pla-based subsidiary of Cincinnati Bell, Inc.

Auxon is developing a printer ac-cess system for Xerox Corp.'a mainframe publishing system.

"The vast majority of the For-tune 500 are studying it. The top 100 have taken measures to ad-dress it," Deakins claimed. Several companies are al-ady noted as innovators in the

Pricery aftermentive Dutaquest, i.e., and other market research firms that follow the embryonic market are usable to delineate how many CPU-resources are needed to support mainframe publishing computed with traditional applications like general ledger, but the cost is believed to be high. "Nothing fills up a mainframe faster than lost of graphics and a few headed thousand pages of text," and Dwidt H. Goodstein.

gle sheet to back up its itemised billing, a practice that tends to

ed \$35,000 to \$50,000 software to package and a \$100,000 printer a, consume the equivalent of \$1 million worth of a mainframe, he

sakins noted:
IBM established an electronic
blishing business unit in Boutr, Colo., two years ago and iscring both a publishing Solunpac and individual modules of
Master publishing series. Although deaktop publishing enjoys more popular support, electronic publishing is likely to become a permanent featur many MIS shops for the fol

Master publishing series.

Mi is a large user of mainframe bilishing, generating one minor original pages per year, sich are reprinted in six billion ges of documents, said Jeff W. 1800. general ing reasons:

o "The data base is on the mainframe," and key information can be extracted from it and plugged into a publishing system that prints out policies, and Frank G. Zdanowski, senior development

conter analyst at Lumbermen's Mutual Casualty Co.

Many authors can work on one document simultaneously in a document simultaneously in a controlled environment, and each effort can be made to conform to a corporate style, said Herman W. Prescott, vice-presint of information services at Information Services.

dent of information services at SEI Information Services.

• Boeing Computer Services was able to reduce its cost of the produce its cost of publishing software documents into from \$1.20 per page to \$4.5 per page after it established mainframe publishing, and \$5.0 per page of \$1.5 per page after it established mainframe publishing, and the effort at its Vennas, Va., nice. A ler is now with IBM' a publishing minimum publishing and publish

#### MIS not always in control of publishing widely. While some MIS depart-

BY JAMES A. MARTIN

At the Mattel, Inc. toy company in Hawthorne, Calif, employees in the Package Design group are putting away their yellow stess on the text on Mattel toy packages and the instruction booklets side will be created and designed in-house using desktop publish-investication.

m-nouse using eastrop publishing technology.

As is the case with Mattel, dealtop publishing — once the renegade application brought in through the back door and largely ignored by MIS — is finally on the verge of entering the corpocomputing mainstream, ac-ng to MIS and end-user

cording to MIS and end-user computing managers.

The Mattel meriecing division, for example, will be using stone, for example, will be using the stone of the sto

Despite desktop publishing a owing acceptance, MIS con-oliover and support of desktop

water, water some outs output-ments are making it a point to develop, support and encourage deaktop publishing, others con-tinue to look the other way, of-ten forcing users to fend for

Post the 'geo-whiz' phese
"The honeymoon is over," said
Rick Young, a senior analyst for
electronic publishing at Dataquest, Inc. in San Jose, Calif.
"We've gone past the 'geo-whiz'
phase of desktop publishing an
now it's time to wake up and face the morning after. Now we have to decide how to work this rela-tionship between MIS and deak

At Teledyne, Inc.'s Semicon-ductor Test Division in Los Andactor Test Lorence geles, a publications, documentation and promotions group uses the company's standard platform, Sun Microsystems, Inc. a Sun-2 workstations, and a Unix-based publishing program

The group's Sun workstations are networked with the other Sun computers in the divinion as well as with its Digital Equipment Corp. VAX minicom-puter, located off-site in Agoura Hills, Calif., according to Sue

ns manager. Often, raw data is pulled off

station for use in either a technical manual or a graphics presen-tation. In addition, the publications group can communi-cate with any Teledyne site cate with any releases site worldwide to exchange data and graphics. However, Hudson each software support for the publica-tions group comes mainly from two technical writers within the

group.
The MIS department at Champion International Corp. in Hamilton, Ohio, does not control raimson, Omo, does not control the hardware and software ac-quisitions made by its personal computer users. As a result, us-ers have more freedom to decide what tools they need, yet they are sometimes left to their own

Because deaktop publishing represents a small fraction of the company's applications, there is no strong concern for enforcing standardization. Champion's deaktop publishing efforts are the VAX and ported to a work standardization. desktop publishing efforts are minimal, confined mostly to a small group of public relations employees producing perulations on both Macintonhes and IBM Peruosal Computers.

one common concern is the lack of control MIS has over the data generated by deaktop publishing programs. Few, if any, packages allow for uploading

IBM's Systems Application Architecture, with its Document Content Architecture protocol, and Digital Resignment Corp.'s Digital Document Interchange Format prumise to provide the island of environment that would bring deaktop publishing files

## Claris buys Nashoba Systems

BY JULIE PITTA

MOUNTAIN VIEW, Calif. -MOUNTAIN VIEW, Calif. — Apple Computer, Inc.'s software subsidiary, Claris Corp., next week will announce the purchase of Foster City, Calif.-bassed Mac-intosh software developer Na-shoba Systems, Inc., according

shoba Systems, Inc., according to sources close to Nashoba. The price of the acquisition remains undisclosed. Privately held Nashoba is the developer of Fileware, a data manager for the

maker 4 to its line; the product added multiuser capabilities to

the company a line.

According to Infocurp., a Cu-pertiso, Calif., market research firm, about 50,000 copies of Flienniker for the Mac, have Filenniker for the Mac, have

SMIT composition
The acquisition of Nashoba
places Claris in direct competition with its leading third-party
software developer, Microsoft
Corp. Microsoft File is the
leading product in the flat filer
category. However, File-maker
A currently selling more briskly
than the Microsoft package, ac-

cording to Infocorp.

Filennation 4 is positioned to bridge the gap between entry-level flat filers such as File and more complex data base managers such as Acius, Inc. 4 Fourth Dimension for the Mac.

The purchase of Nash represents the second strategic acquisition for Claris. Two weeks ago, Claris assouanced the acquisition of Styleware, Inc., a

Houston-based developer of software for the Apple II line of personal computers.

Nashoba was originally esta lished in Concord, Mass., who

Software Engineering of America, helping over 6,000 MVS Data Centers Worldwide run more efficiently.





# S.E.A.'s DATA CENTER OPTIMIZER software systems

Guarantees you Substantial and Immediate Savings in many of your most critical areas of Data Center Operations.

EA - Data Senter Optimizer provide Linduck that is immedified birty. Designed by user input the Data Center Optimizer is only nertiliable to the individual sold birty and the packages that make up the float sphere Optimizer. The linduce will be a floated by the float sphere Optimizer.

ia i v nov v nadet er

PDSUPDTE

PRO-2 Apr of m

ODDS

FREE - NO OBLIGATION.

SAVRS ---

VCFL -

VCF M

SEA

SOFTWARE ENGINEERING OF AMERICA, INC

For o free trial or (516) 328-7000



## HP hikes prices across the board

DRAM chip costs named in 25% maximum memory add-in increases

#### BY JAMES A. MARTIN

PALO ALTO, Calif. - Hewl Packard Co. last week an-nounced it will raise prices by up

ds due to increased costs in dynamic random-access memory (DRAM) chips.

on 2M- and 4M-byte add-in memory boards for HP 3000

Micro XE, will increase 22% to 25%, the company said. Prices for HP 1000 computer memo-ries were increased 3% to 10%, and prices went up 3% to 15% for the HP 9000 Series 300 engineering systems.

The HP 9000 Series 330 was

## Achieve Excellence In Train with PHOENIX/Micro

PHOENIX® is well known as the industry standard in computer-based training (CBT) with over 5,000 installations worldwide. To promote excellence in courseware development within this large user community, Goal Systems created the PHOEBE (PHOEnix BEst) award to recognize outstanding achievements in CBT authoring.

Now PHOENIX/Micro has been enhanced to maintain this tradition of excellence. The micro product has all the same standard features of our mainframe PHOENIX and more:

- · Screen Capture Facility (Text and Graphics) • Full Mouse Support
- Exit to Programming Language Advanced Graphics and Text Editor
- Interactive Videodisc with IBM Info Window Support

And no other system allows course uploading for PHOENIX mainframe presentation with no modifications. What this means is faster course development, more appealing courseware, and the flexibility to develop the

course where it's convenient while delivering training where it's most effective. If your goal is to provide excellence in training, you need PHOENIX/Micro from Goal Systems. With our new pricing structure the full functions of PHOENIX/Micro can be yours

for as little as \$315 per month. For more information or a free demonstration diskette,

PHOENIX/Micro Supports IBM XT, AT, PS2 and compatibles.



Goal Systems In Goal Systems International S.A.R.L. \*88 avenue de Wagram \*75017 Paris, France \*Phone: (1)42 67 55 55 \*Telex: 641.094

call 800-848-4640.

#### PC strippers tease DRAM board makers

The shortage in dynamic ra sccess memory (DRAM)

they have been receiving scat

E RAISED the price to make it not economically feasible to cannibalize our boards."

FRANK MARKS QUADRAM CORP.

the hard-to-set DRAM chins by

ut if it spre

mis sanz. andram Corp. raised of its Quad 386XT acc

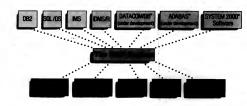
IAMES A MARTIN

# Join the Big Leagues **SOL\*Forms**



To find out more, register for the next ORACLE seminar in your area by filling out and mailing the attached coupon

# **Get the Facts from Your DBMS.**



he most powerful applications software has joined forces with the most popular data base innead forces with the most popular data base meaningful facts. To analyze, estimate, optimize, simulate. To produce custom reports and color grapts. Whatever your information need, the SAS System delivers more from the data you store.

#### Don't Just Store Your Data. Explore Your Data.

The SAS System's madyle-use tools uncover the rate minering of all floor names and mathers. Forceast sales and cost flow. Perform statistical analyses. Build invasculat and planning models. Create groundshees of unlimited sizes. Schedule projects for best taxe of time and resources. Froduce statistics of personative laters, control scientifical, during with professional reports. Spot relationships and graph trends with powerful preservation agraphs.

Or develop your own applications with the SAS System's difficult fourth-parameter language. Opening these institutions of Way you users, even those who know nothing about data bases, have immediate access to the data they need. It's as easy as filling

in the blanks!

Extract data from your

DBMS for use in SAS System applications:

Load data from the SAS System directly

System directly into your DBMS. Update values in a data base directly from a SAS System application. All without risk to data security. The SAS System lets you choose which users browse or update specific files.

#### Got the Facts Today.

Bring the SAS System legister with your data base. Varif many high county activers—plus

# Get the SAS System.

Ridge Medical Supplies Inc.

Morgan Cosmetics Inc.
P Chart for Perfume Bottle Capacity

production of the second

EMS Software International Countries with Products Installed Quarterly Sales

CPU Utilization by Hour

Schedule for Well No. 121-005

## 3+Share boosts server options

BY KATHY CHIN LEONG

SANTA CLARA, Calif. - 3Con orp. is releasing an enhancer resion of its 3+ operating sys version of its 3+ operating sys-tem that is expected to give the vendor a significant boost in cap-turing a market previously resis-tant to its network offerings. The pivotal aspect of 3+ Stare 1.3.1 is its ability to use an Intel Corp. 80286- or 80386-

Macintosh software.

Prior to this release, users had to buy 3Com's dedicated file server in order to mix Macin-

Looking for an edge According to Wes Raffel, vice-president of software marketing at 3Com, the dedicated servers represented only about 20% of the company's entire installed

#### NEC, Hitachi go at AS/400

NEC Corp. and Hitachi Ltd. have become the first Japanese com-puter makers to announce headon competition for IBM's AS/400. However, both compa-nies said last week that they have no plans at this time to self

have no plans at this time to sell the systems in the U.S.
Introduced last week were the NEC ACOS 3400 and the Hitach Hitach M620. While a NEC spokenman said the 3400 competes more with IBM's 9370, a Hitachi representative posi-tioned NEC's entry in line with the Hitac M620 and IBM's AS/400. The ACOS 3400 offers AS/400. The ACUS SHOW Games 8M to 96M bytes of main memo-ry and is available now at month-by rental fees equivalent to \$22,308 to \$46,462.

We had no current pla We had no current passo and ng the system here," said a Information Systems, Inc. sman based in New York, are already selling mid-

nge Unix machines." The Hitac M620 is av

in three configurations and com-petes with the mid-range sys-tems in the AS/400 line, the Models B20 to B40, according to the company. The Httachi ma-chines carry 8M to 32M bytes of Prices range from the equiva-lent of \$88,461 to \$226,923.

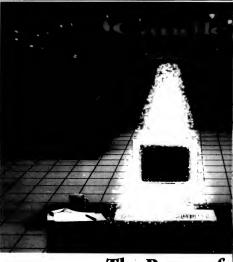
plus another \$46,153 for the op-erating system. Hitachi said it plans to sell 3,500 units within ree years of the shipment date, sich is scheduled for late Sep-

tem, priced at \$2,100, frees up to 200K bytes of system memo-

ment driver that real

ntoshes on a

rating system, 3+Share 1, by 45%. Both products



# The Power of **Automated Operations**

## Distributed tools outrun IBM offerings

BY ELISABETH HORWITT

NATICK, Mass. — Systems software scheduled for introduc-tion today is said to provide IBM users with distributed data base and application capabilities that

reportedly are still in the devel-opment stage at IBM. to unveil two products, Advanced Program Exchange (APXchange) and Advanced Pro-gram Explore (APXplore), which will provide IBM users with a distributed system environment comparable to a Digital Equip-ment Corp. Vanchuster, accord-ing to Gigi Wong, director of data The products create "a true

wong sand, in which users can ac-cess computing or data base re-sources on another host across the network with the same case with which they access their own local system. Although IBM is

ts to provide th

APXchange reportedly will take care of basic distributed networking functions such as

work to the ri

net LU6 2

nt for multiple acco

ware plays a key role in the appli-cation, which will save the com-pany from sending a lot of redundant mail. Gavin said. APXchange allows software developers to invoke the full set of LU6.2 functions using two

simple commands — send and receive — Kramer said. The software is said to acreen developers from the complexities of LU6.2, which features 23 verb states, be added.

in also said to provide a simpler set of LU6.2 verbs, but it will not set of LUG.2 verbs, but it will not be available until late 1969 and is only announced for IBM's VM and OS/400 systems so far. APXchange-MVS for IBM MVS systems is available now and is priced at \$78,000 for IBM

and is priced at \$78,000 for IBM 3090 systems. The initial re-leases of APXplore, which sup-port IBM CICS and IMS environ-ments, are priced at \$22,000 for the 3090 and are scheduled to be available next month, according

"IBM is sure to come out with features comparable to ours, but we figure on having a three- to five-year market window," Kra-mer said.



ower You Trust Behind the Master Console It takes power to automate. Not just iron and a little software. But a force behind the automation tool that can help when things get tough. Candle, the company that defined MVS performance with OMEGAMON,® has entered the automated operations field with AF/OPERATOR™

**Energize Just What You Need** Candle's family of automation products is flexible enough to meet your individual needs-from simp message management to remote operations. It's up and running in an hour, handling basic message traffic and doing flawless IPLs at warp speed.

Or Blast Off Into Pull Automation When you're ready to automate recovery or complex procedures, AF/OPERATOR enhances your growth. With an automated operations product from Candle you're uniquely positioned to handle whatever you need in the engine room, including automated availability and performance when the time comes.

Streamline the Engine Room Basic message management is the first step. And with AF/OPERATOR's sample library, that first step is a snap. Yet, your horizons are never limited because you have the power to tap into fully integrated automated operations with the ability to control MVS and its subsystems—IMS, DB2, CKS, and JES.

With High Performance System overhead isn't an issue when you can have less than 1% CPU consumption. Nor is scheduling when you can make changes to the system on the fly, rather than waiting for an overnight 'gen.

And Support From the Mother Ship When you take a step into the dimension of automated operations, you want the best ground crew behind you. And Candle's support has received DataPro's highest rating. This support extends beyond round-the-clock customer service and education. Candle spends \$30 million a year in R&D so you won't ever be left behind.

So whether you're going to the outer limits of automation or just streamlining the engine room, Candle is ready to join your crew. Let automated operations beam down into your data center. Call Terry Forbes today at (800) 843-3970.

#### Candle Candle Candle Corporation 1999 Bundy Drive

Los Angeles, California 90025 Copyright #1988 Candle Corporation, All rights res

## NCR spools up gap-filler

DAYTON, Ohio — NCR Corp. is prepar-ing a new series of NCR 9800 transaction processors intended to plug the gap be-tween low-end 9800e and high-end V se-ries mainframes that do not share the 9800's architecture.

1800's architecture.

The processors, expected by year's end, would provide a seamless upgrade seth to the high-end NCR 8800, according to Robert James, vice-president of marketing at NCR's U.S. Data Process-

Group.

The difficulty we have faced is that ne significant percentage of the [NCR eries mainframe] base is already at or over the power range of the currently over the power range of the currently inversible 9800," James told Computer-vold. "We have bodly needed a more worful 9800 to address that part of the se, I don't want to give you the specific not, but you can look forward

we always known need to be in the ct." James said. Among these are a

saction monitor, a relational data and various communications facili-"We're still fleshing out the array of es that are required for getting into all sets," be said. NCR's plan is to release these software tools as they are

Meanwhile, NCR has devised a migra-on aid that can be used to off-load the tion and that can be used to off-load the NCR VRX maniframe's work load onto a smaller 9800, James explained. "We have a System Bus Adapter which allows most of the current VRX boxes to be attached to the 9800, "he said." To the 9800, the [attached mainframes] look like an [additional] application processor." James said the technique can be used to off-load the technique can be used to off-load

the technique can be used to off-load mainframe program development tasks and small system utilities to the \$900. Some users have opted to buy the Sys-tem Ban Extender option along with a \$900, while others are prepared to wait for the high-end \$900. according to Emile Bonneczae, president of Bonne-czae, McLeroy & Harrison, Inc., a Dallas-sia. These West Sept will be interesti-

based NCR software provider.

"These V series users will be interested in moving to the new 9800s as long as they have the kind of things that have been promised for them." Bonnecare said. "People seem to like the idea of buying 'slices of power,' but they still need high-performance processors."

Into the next decade

high-performance processors.

NCR has told some users that single processing modules on the 9800s will be as powerful as entire NCR 8555 ma-

as powerful as entire NCR 8555 ma-chines, Bonnocare said.
"So far, the 9800's attached proces-sors aren't really powerful enough to han-dle a bank's largest number-crunching jobs," be said. His firm was one of the first V series shops to migrate to a 9800 nearly

V series shops to migrate to a \$800 nearly three years ago.

One NCR mainframe user that did not wait for the high-end \$9000 was the Sor-ran Bank NA branch in Hopkinswille, Ky, which handled \$100 million in assett, which handled \$100 million in assett, which handled style-organized aboost in performance, "naid processing at the bank, which had owned an NCR \$505. In Pedruary, the bint is stalled a newer NCR \$565 Model 22 with higher causacity and better performance.

"The maintenance of the older ma-chine was getting to be prohibitive," Ash-ley noted, "and buying newer technology carries a lower prior tag." As a result of the recent upgrade, the bank will not be in the market for an NCR 9800 anytime

But the new and improved 9800s will not satisfy the capacity requirements of the largest NCR mainframe shops, James said. NCR recently introduced the 8800 mainframe as an upgrade for the largest batch-oriented systems in the NCR user base. "Our base seems very happy with the 8800," be said, "but the 8800 still has the pre-9800 architecture."

nal Science Foundation's NSF net

1-800-4-INGRES

#### (1-800-446-4737)

19-Jul 17-Aug 23-Aug Los Angeles Sucrament 23-Sep 03-Aug 13-Jul 22-Sep 17-Aug

08-Sep 19-jul

IS-NI"

04-Aug 08-Sep

17-Aug

19-16

25-Aug 22-Sep

IS-Sep

11-Aug

14-Sen

LS-Sep

23-342

25-hag 22-Sep

25-Aug

14-Sep\*

22-Sep

IS-Sep

73-34

15-Sep

35-Aug 08-Sep 21-Sep

15-Sep\*\*

Tampo

New Orleans Burlington

NE Saddle Brook

New York

Philadelphis

64-Aug 20-Sep

\*UNIX Worksto

IBM tests

gested, you can add capacity " said Dan Bellingham, NSFnet suckey," said Dan Bellingham, NSFnet succiste program director. For their arts, both IBM and MCI see Phases 1A ad 2 of NSFnet as a testing ground for of-erings that could become commercially valiable in the new for-

"This project is important to us for learning how to amange mos-SNA environments," particularly Transmission Control Protocol/Internet Protocol (TCP/IP), which is used throughout NSPaet, said Robert Mazan, director of development at IBM's Technical Con-puting Systems Devision. For example, IBM had to write routing software for project the control of the Development of the Control of the Contr

bilden. now and at 95M outpute, on use-ture, Mazars supports TCP/IP on its BM Personal Computers, VM, AIX and RT systems, the vendor has yet to an-nounce TCP/IP network products. IBM hopes its TCP/IP experience on the NSPnet project will help it further pene-trate the scientific, research and govern-neut sectors that are primary sucres of the

trate the scientific, research and government sectors that are primary users of the de facto standard, Manus indicated.

NSP-het also will allow IBM to "experiment with GSI migration." Mazus and Right now. IBM is justify working with the University of Wisconsin to develop a University of Wisconsin to develop a University of Wisconsin to develop a University of Street when the Foundation begins its migration TCP/IPI to the ISO's Open Systems Interconnect, the added

IBM is also using NSFnet to test ways to link its Netview to non-IBM systems, y the third quarter, the vendor should developed an extension of Netview software that allows the network manage ment system to accept netalerts alarms

the TCP/IP-based Simple Gateway Pr col, be noted. MCI'a net-

work services and Network Inc.'s IDNX Ti

ready have the ability to send and other data

to Netview, via the Net-view/PC inter-The next step is to let those operators respond to network problems by direct-ing a NET or MCI switch to reroute traffic over an alternate line or reconfigure bandwidth to take on the extra load. This capability will require IBM to provide new, interactive connections between its

new, interactive connections between its network management system and non-IBM networking devices. "The ultimate goal is for Netview to control all dynamic abilities of the network," said Walter Wiebe, an IBM manger of networking and communications development.

switch can reconfigure bandwidth as soon as it receives the command, but MCI has

vendor plans to announce early next year a commercial Digital Reconfiguration Service that will provide dynamic reconfiguration of bandwidth, according to Never Vec-President of Network Systems Eagineering Lurry Bounnau. Until that service is available, nears must reconfigure to the New York of New York of New York on the New York of New Yo

nts to its Netview/PC supp that will let its network ma vice deliver additional kine

# OUR NEW SEMINAR SHOWS YOU HOW THE POWER OF INGRES PUTS CORPORA AT YOUR FINGER

#### ONLY INGRES RELATIONAL DBMS AND 4GL GIVE YOU THE SOLUTIONS YOU WANT ON THE COMPUTERS YOU USE POWER

If you're in charge of MIS, or are involved in the evaluation and selection of a database system, here is your opportunity to learn about the most advanced integrated Relational DBMS and 4GL ever. In just a few hours, you'll

know more about how to evaluate today's systems than you ever knew before. Because, after that, you'll be comparing all other systems to INGRES's Total Perunce Architecture."

Total Performance Architecture (TPA) combines Tools. Power, and Access for applications development, transaction processing, and seamless information access. INGRES can be implemented transparently across over 40 hardware and operating system platforms including DEC, IBM, and UNIX, from mainframes to PCs.

Through technical presen tations, case-studies, and live demonstrations, you'll see how



INGRES's powerful 4GL tools help a major consumer products comparty save on applications development costs. INGRES has the only fullfunction (GL tools which are tightly integrated with our SOL REBBAS and are instantly nortable across PC, UNIX, VXX. and BM platforms. INJRES visual program-rung methods facilitate

rapid prototyping and modification

edge to become produc-

the nebt sway

**INGRES Query and** Reporting Tools are used by a telecommunications company. INGRES curve with easy-to-learn, "fill-in-the-form interfaces which allow direct access to critical information INGRES SOL also interfaces with Lotus 1-2-3, so users can leverage existing knowl-

The INGRES Multi-Server Data Manager is the only Relational sor, or netw CPU configurations. With the unique Al-based Query Octimizer, INCRES help one of the world's leading

business and consume

DBMS to provide scalable QLTP performance scross single, clustered, multi-

INGRES GARWAYS gree a pharmacoutical company direct access to data trapped in an older file system and the ability to combine that data applications. DVGRES Copragns allow access to data across different

file formats (such as

dBASE Ell and RMS) No

other relational databa

offers these instant links

tickler data files.

ÿ

Using INGRES/STAR, en imm stional finan

cial giant links information systems in the United States Farmer and Japan. INCRES/STOR advanced distributed dutibase management contem coul ship redes and improves access while reducing complex ity and costs for hunds shop foor to the board

the features of each INGRES product meet the challenges. of today's MIS department from applications design and prototyping through implementation

We'll present specific case-studies showing how INGRES has served the needs of thoussands of companies worldwide by improving development productivity by a factor of five.

reducing life cycle maintenance costs, and providing true appli-cations portability. So, if you're a decision-maker involved in evaluating and selecting database systems.

come and see why Fortune 500 companies worldwide are using INGRES to meet their MIS needs To register for the seminar nearest you, check the listing

for your area and call us toll free in the U.S. and Canada at: 1-800-4-INGRES

(1-800-446-4737).



#### **EDITORIAL**

## Taking the lead

ICROSOFT DESERVES CREDIT for being the first of the big three software vendors to break the standoff over pricing plans for the OS/2-Presentation Manager environment. Perhaps now the rest of the industry will do what it should have done months ago — tell users what they can expect to pay for software next vendor.

Microsoft has quietly let it be known that it does not intend to charge more for existing applications that it ports to Presentation Manager. That it the first time any of the major developers have gone even that far in outlining a pricing policy. Users who plant down \$325 for OS/2 Standard Edition Version 1.1 later this year can at least be assured Microsoft work put them over a pricing barrel as well. Will Lotus and Ashton-Tate now give users the same assurance?

Microsoft's detractors will argue that the task of porting to OSg2-Presentation Manager is a trivial one for that company, which already runs many of its major applications under the similar Windows interface. But that is more a function of good planning on Microsoft's part than it is a reflection on technical simplicity. Microsoft has said all along that Windows was the road to Presentation Manager, and it has apparently followed its own advice.

sowed as own shroce. The rest of the soft mass related to the soft mass related to the soft mass related to the soft mass of pick commitment. Lotus announced a field of Persentation Manager products 15 months ago but to date has declined to give so much as a hint of to the sow it intends to price them. Abstron-Tate has implied that it will histe the price of Dasse for the work of the soft mass related to the soft mass related to the soft mass related to the soft in the same work (get appecific. Ditto for Botton, the standard-bearer in the last software price war, which so far has been must on its pricing planes as well.

Will the industry see another price war fought on the Presentation Manager buttlefield? We hope not. The software pricing akirmishes of 1985-86 did little more than divert attention from the more important issue of how to maximize the value of the existing technology. So much potential exists with OS/2 and Presentation Manager; it would be a shame to see the market leaders waste time jockeying for position on the discount store's shelves.

Instead, attention should turn tolphe issue of perceived value to the user, and that where Microsoft has seized the initiative. By holding the ine on applications that run under MS-DOS-Windows and the OS/2-Presentation Manager environment, the company is saying the platform doesn't matter. As long as the Presentation Manager version of an application does not add significant features, multiuser or server capabilities to the DOS version, there is little justification to the control of the control of

ties to the LUS version, there is little justification for raising the price.

Lotus may argue otherwise if it chooses to price its Presentation Manager version of 1-2-3 at a premium to the MS-DOS version. But it should be ready to prove it. Microsoft has draw the first line in the pricing standoff, Other vendors will think twice before they cross it.



10mm National Weather Service admits its supercomputer models are inadequate for

#### LETTERS TO THE EDITOR

#### Into the future

My congratulations to Jackie Reynolds on her article "Missing managers must see the "MISS" homesthy" (CW, May 30). The problem I see in this area is that the MIS director or viceies that the MIS director or vicepresident of data processing has a five-year plan to automate his

is that the MIS director or vicepresident of data processing has a five-year plan to sutomate his data center and does not know where to begin. So, because of his past 10 or more years of experience; in DP and knowledge of out-of-date products when he was once an operator, he tries to implement these same outdated products in a data center that wants to automate for the fuline.

Obviously, total disaster occurs and more people need to be hired because of the "old" philosophy of the top MIS director from his past knowledge of what worked back then.

Sharon R. Dougherty ational Sales Director Bennett Software

#### Use it wisely

There is always some risk that successful specialists in one field may begin to believe they have some unique insight, knowledge or wisdom applicable to life in general. This is rarely the case, as in Charles Lecht's column concerning the electoral college (CW, May 16).

This nation was designed as a republic and not a pure democracy. The republic is a safeguard against the abuses of majority rule. It insulates our political life from the whims of an ignorant

The idea of telephone elections is abhorrent and antiethics to stability and justice in government. First, the potential for COMPUTERWORLD nisase is manifold. But more imcortant is the direction our nation would turn politically if that dea took form. The otherwise pathetic and generally parasitic nasses would suddenly influence.

Getting out of the house to seek out a local polling place at least separates the political couch potatoes from those who are motivated to express a real interest in the life of the nation. I am an enthusiastic believer in the use of modern technology when the properties of the use of modern technology when the properties of the use of modern technology when the properties of the use of modern technology when the properties of the use of modern technology when the properties of the properties the properties of the properties the properties

waste appealed: "Im in a continual battle of wits over the introduction of computer data processing in my field of business. I have personally argued the point in favor of more telecommunications services and computers in daily life. However, there are practical limits that must be observed. Technology for its own sake cam be a disaster.

Steady state

hank you for including some of

try comments.

Wedness of the comments of the

Another dimension of benchmark comparisons concerns whether or not the product is commercially available. Relational Technology. Inc.'s

results were announced on a hybrid version of the system that will not be commercially available until late in the year. Sybase is also working on advanced versions that will give

Sybase is also working on advanced versions that will give high transscious rates on multi-processor machines in approximately the same time frame. However, it is an applies-to-oranges comparison to compare Sybase a commercially available version with a demonstration

Director of Product Marketing Sybase, Inc.

#### Understand IRM

I agree with Reed Phillips Jr., director of IRM at the U.S. Do partment of Commerce, that the administration never really understood the IRM concept [CW. June 6].

It is unfortunate that Robert

Be to unfortunate that Robert Bend, a former IRM official at the U.S. Department of Agriculture, did not understand the IRM concept at the time his position was transformed into the Office of Information Resources Management. Many newly appointed to make ground IRM managers because they did not understand the concept. The problem with the lack of acceptance of the IRM concept, managing information like any other organizamation like any other organiza-

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 chitsate Road, Framingham,

### HP ripples industry with New Wave



er with a

sultants were quick to praise it as the first office automation prod-uct with a modern interface and a

egration.

Others weren't as quick to otice its arrival. HP's informanotice at arrival. It's anomation systems products are not well known outside the company's traditional manufacturing and accentific processing mar-kets. The firm is just starting an intense marketing campaign to

Like OS/2, New Wave is a DOS applications, but to fully ex-ploit the environment without software. It can run existing DOS applications, but to fully ex-ploit the environment, you need software specifically written for There isn't

any yet.

But HP got lacky in a very

trange way. Apple determined

to protect the value of its graphi
al user interface and such dis
roots and HP over New Wave

and HI work yet will will out to the

notif its underlying Windows envi
cummittes and consultants to

spend lots of time explaining

what New Wave is to users ja,

he process of analyzing the fliw
uit for them.

to New Wave that is unique among office automation ven-dors. This PC interface is the first we know of that will eventi-ally run not only across PC plat-forms (DOS and OS(2) and increase the vendor's proprietary mid-range platform (HP-3 000 and Spectrum) but also across the vendor's Unix products. This feature is innortant, be-

This feature is important, be httegration will occur via HP'a Information Access prod-uct and the Agent facility in New Wave. These are nottware prod-ucts that let systems be inter-connected — and data be moved — across PCs as well as across

New Wave is enticing to users

Apple suit actually opened windows for product

for a number of reasons, includ-ing the following. • Users like the chance to get a

tions across tons.

They like the promise of a to-tally integrated, object-oriented environment based on rewrites tions across data sets, applica-

NNOUNCING software for a

platform that features integration as an enticement means you are gambling on the timely availability of other software from other developers.

whole new products written to the New Wave convironment. And therein lies the rub. HP's New Wave is an environment on top of an environment, the increases, the wide was the representa-one of more than eight choices now arrelable to enterprising software developers: 1. DOS.

1. DOS.
2. DOS under Windows (which Windows, which DOS?).
3. OS/2 Version 1.0:
4. OS/2 Version 1.1 (with Presentation Manager).
5. IBM's OS/2 Extended Edition.

Version 1.0, 6. OS/2 Extended Edition Ver-sion 1.1 (with Presentation Map

must compete for develop-nt attention in a very crowd-market. Add in the fact that mates, New Wave req about 25% more develop effort for each software pact as compared with the Pres

#### The medium to the message High-tech firms seek to optimize effectiveness of information processing

CHARLES P. LECHT t mold of

even modern printing companies are creating or joining collec-tives to fund the creation of me-dia laboratories to conduct re-

oratory underscores importance being attack

content to information media is too critical to be ignored.

Japanese firms are also in-tensely interested in media stud-ies. Some participate in the fund-ing of labs abroad, such as at

nt based in Tolore

onese companies i ad Sony Corp.'a M

sort of. They w

ly recompiling it into pe and original turtles.

In the midst of the legal flap, Speck were not to lanch one dry with fellow employees. In the back of his collegans is an; Speck found strips of paper printed with what looked manningly like the very code of an unreleased version of UCC11 flat be had been accused of stealing. "Where the hock did you get this?" he saked incredisously. "It's paper my lidd brought home from day-care," came the reasonate.

Occupying 2,100 m

rs of floor space in one of To-ro's high-rent districts. Media orld is an advanced technical empostration center that of

been merged into one.

Sony has built a conference room that responds to the human voice to turn on or off the lights, open or close the curtains Video projection s connect to worldwide con

rage, retrieval and display of

Scott Speck, a former Uccel sys-tems programmer. Specis was later taken to court by Uccel's buyer, Computer Associates, for allegedly taking proprietary Uc-cel code with him to his new company, a churge he denied. In the midst of the legal flap,

#### Well, they have to start somewhere

CLINT WILDER



A group of Dallas-area day-care toddlers were recently dis-covered working on a project of recompiling the code of Uccel Corp.'s UCC-11 data center job

There's one company which supports the UNIX OS best:

Unisys gives you as many hardware choices as you'd get with up to four ordinary vendors put together: 14 models to fit from desktop to data center, to serve one to 384 users, to meet your needs now and in the future.

The U5000 Series is built around the Motorola 68020, with models running single and multiple processors from 16.6 to 25 MHz. It supports up to 128 users. 4 to 64 MB memory, 80 MB to 8.1 GB storage. The U6000 Series is built on the 180386 and runs UNIX and

MS-DOS applications concurrently.
The U6000/50, the first in this line, handles 32 users. Max memory:
64 MB; max storage: 2.3 GB. Cartridge tape and floppy are standard.

The U7000 series comprises the most powerful UNIX systems we make. Configurations handle up to 384 users with up to 32 MB memory; 16.4 GB storage. Cache memory and dual processors define the top model.

To make sure you get the true "universal" UNIX OS with Unisys, we've entered a special association with AT&T. Plus, we're committed to UNIX V3. POSIX and close adherence to all existing X, OPEN standards.

Look into Unisys. We're at enbillion-dollar computer company committed to making UNIX OS a powerful business tool. From training your people to helping you plan the whole system, unisys gives you one of the broadest, best-fitting and bestsupported ranges of UNIX solutions going.

For more information, call us at 1-800-547-8362, ext. 104.
BETTER INFORMATION.
BETTER DECISIONS.



#### **HP** ripples CONTINUED FROM PAGE 19

New Wave software arrives in the mar-

ketplace. But some developers will find the investment to be quite worthwhile. HP re-cently announced Microsoft's intention to mark . a New Wave version of Excel. (One might say Microsoft has a vested interest )

#### Excel is a first-class package, with a very

respectable market share. Microsoft's reputation as a savvy and very profitable software company may entice other de-velopers to follow suit. ers to consider. Announcing software for a platform that features integration as an enticement means you are gambling on not only that platform and your software working well together but also on the timely availability of other software from other developers.

It is the total software and its com ned capabilities that make any envir ment user-irresistible. Every New Wave developer has a stake in how many other developers decide to plunge into HP's

HP and Micr osoft are still being succ by Apple, which could make the gamble just a tiny bit riskier. This issue is not a major one in our eyes, but then, we're not developers.

There are additional facts for develop-

Nothing written here is meant to suggest that New Wave is not a terrific idea or a nice, robust platform. HP's own deopment community will no doubt give it a long look. But HP developers are gen-erally minicomputer-focused rather than PC- and graphical user interface-focused. They might well fail to exploit the poten-tial — or it might take them a long time to

completely understand how best to suc-Then again, there is the possibility — actually, we'd guess, HP's fondest dream — that New Wave will be recognized as a

table standard for a new generation of PC-compatible software. If that dream comes true. HP might find itself in the very middle of the next

since EXPRESS and pcEXPRESS share a common sys-

them to the host, and distribute them company-wide

Choose EXPRESS and use its integrated 4GL to build your

EXPRESS Marketing Management System, to track and

evaluate performance by product, geography, and time; ana-

EXPRESS Sales Management System, to track individual

oustomers, products, and territories, evaluate performance

EXPRESS Procuracial Management System, for fine

success factors, analyze trends, highlight exceptions, and

Either way, you've got the tool you need. Because when it

comes to decision support, EXPRESS makes even the toughest

For more information, call us today at (617) 896-1100.

axom as on the reasons behind the numbers.

job seem like nuts and bolts

planning, budgeting, consolidation, tracking, and reporting

EXPRESS Executive Information System, to track critical

Or select one of its turnley application products:

lyze competitors; and optimize your marketing mix

vs. quota: and develop targeted sales strategies

Application solutions

own decision support applications.

x, developers can build applications on a PC unload

#### Medium

CONTINUED FROM PAGE 19

In one minitheater projection environ-ment is Sony's Video Theater System. The ease of use of this technology con vinces me that the day of the conventional movie camera projecting film from the rear of a theater is destined to die.

And Sony's digital television technol ogy, costly as it may be today, convinces me that today's analog TV will soon suffer

me fate With the arrival of digital TV, displays

#### ART OF Media World's reason for

existing is to convey the rule that media may be as important as the information they contain in conveying any message.

for computer systems and for televis will quickly merge. This done, the day of interactive TV will arrive, bringing a dimension in viewing of fantastic cons quence. Think about the processing pos bilities that may arise through the use of your PC's memory as a video-recording

ese few examples from Media World typify what can be experienced in other media labs in Japan and elsewhere. They serve to point out the weaknesses in our natural perceptive powers and offer hope that through enhancement of our senses, the information we encou inter will t enter the realm of the null and void

#### IRM

CONTINUED FROM PAGE 18

n. Few college MIS textbooks give IRM ade give IRM adequate coverage; some au-thors go out of their way to put IRM in a apter in the rear of the book, with little duction or references. Others omit the concept entirely, and some use the IRM terminology without understanding

There are no easy solutions to prop information management. If these solu-tions did exist, there would not be the ex-

essive applications development back-igs or the systems and program maintenance problems that exist today. This is a nation of experts in on-line musction processing, but the type of in-mation management that can be pro-led by the IRM concept is needed to lead managers in the development of the information they need in decision making for the benefit of the entire organization.

MIS managers have made managers.

agers have made managers have made major con-ns in transaction and on-line proing, but it is now time for those who w the company and know what infor-ion is needed to manage the company or agency information resc tered, can p ie the ne

JULY 11, 1988

information resources

Choose the right tool for the job. cessing and management power of host systems. And

When the job calls for transaction processing, reach

for a record-oriented DBMS But when it demands transleting, sales, fi

or executive decision support, much for EXPRESS® Because EXPRESS is the only integrated system tooled specifically for decision support applications. Particularly

those involving data analyses such as aggregations, corr parisons, time series, forecasting, and modelingcombined with text and graphic output

And now a new generation of EXPRESS is even caster to use, more efficient, and available on IBM (VM and MVS), Digital, Prime, and soon Hewlett-Packard systems. Multidimensional views of data

EXPRESS unaquely combines the familiar analytic orientation of spreadsheets with the power of relational database management. But unlike standard relational systems, EXPRESS provides a true multidimensional view

of data. So it actually reflects the way decision makers want to look at information

#### PC power + host control

22

Designed for a micro-mainframe environment, EXPRESS and its microcomputer counterpart-pcEXPRESS\*\*-combine the

iveness and user friendliness of PCs with the data pro-

## **SOFTWARE & SERVICES**

SOFT TALK

Theodore L. Bogert

#### Rules to modify by

We all have our own horror sto-ries regarding the problems we've encountered as a result of the lack of program modification controls in a production envirrogment

At Comprehensive Banking System, a division of Citicorp Inormation Resources, we have ing and tracking all program modifications to our appli cation software. This system is currently running on an IBM System/36 and 38, with the

The following explains our

Overview of the system The overriding theory behind any system for controll tracking program modification must be based on the cardinal rule: Never allow any modifica

tions or enhancements directly the base code. By dictating that ch By dictating that changes and new programs be created only outside of the production vironment, you establish ore flexible and easily adapt-le conditions for programmi

To accomplish this objec-re, Comprehensive Banking stem created a series of b braries that correspond to diffe ent stages of the modification cycle. As a particular memb travels through the cycle, a tracking program updates a "k record" to reflect the mem-

## Weeding a homegrown shop

Barry Controls picks packaged software to standardize, cut upkeep time

BY ROSEMARY HAMILTON WATERTOWN, Mass. - While

many mid-range users sized up IBM's AS/400 offering last month, one IBM System/38 user was preoccupied with a more pressing and predictable concern: its already-in-motion tran-sition to packaged software. Barry Controls, a producer of shock and vibration isolation de-

vices, has been a System/38 uses since 1981. Late last year, it made its first packaged software purchase, which marked the start of moving from a complete ment to one of packaged soft-

The decision of the company, a division of Barry Wright Corp. to move to vendor software cording to MIS director Paul

First, the parent company's industrial products unit, with six ions, wanted to standardize on certain software packages. Second, for Barry Controls in particular, the current software ved the marks of years of tweaking. Upkeeping the soft-ware had become too time-con-suming for Choquette's staff of

Some programs were devel-sped without thinking beyond the current moment," Chothe current moment quette said. He said be some times has to clear users off the system to do certain closings because they were "developed for interactive environm

The first software package selected was a human-resource and payroll application from Software 2000, Inc. The packthe corporate standard for all industrial products divisions at Within the industrial products group, there had been at least ree different payroll applicans in use, he said The Software 2000 applica-on was installed at the Water-

town plant last year and put into operation in the fall. Ch said an outside consultant is cur-rently evaluating Barry Con-trols' manufacturing needs and ssist the company in selecting a manufacturing resource planning package this year. Additional financial applications wifi be picked by year's end. The transition will take place idually. "There's always some

resistance to change. Overall, I think people are looking forward to it, because we have been in a constant patch-and-fix mode,"

Continued on page 29

## Mathsoft package adds up

BY NELL MARGOLIS

CAMBRIDGE, Mass. - The latest software package from Mathsoft, Inc. promises users charged with ematical analysis a tool that

tions at the speeds allowed by a workstation platform. Stated to be available by sum-mer's end. Mathetation comuser interface, systems pr ing capabilities to afford users the freedom to concentrate or the substance of mati rather technological form, said product manager Sue Hutching

Continued on page 25

#### SOFTWARE NOTES Prime 50 to get Unix

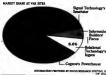
Prime Computer, Inc. plans to put a native version of the AT&T Unix System V operating system on its Prime 50 series of superminicomputers. Currently the hardware supports Prime's proprietary Primos operating system, which it will continue to support. Prime's Unix offering will be made available in mid-

Little-known Ibuki in Mor View, Calif., is offering its Com mon LISP on Sun Microsystems Inc. workstations, according to President Richard Weyhrauch.

wlett-Packard Co. and Verdix Corp., which is based in Chantilly, Va., recently signed marketing and development agreements that will put the Verdix Ada Development Sys-tem on HP workstations and there will be a series of six product releases during the next 12

### Data View

VAX sites welcome newer talent ata base vendors Relational Technology and Oracle are gaining a foothold in the DEC VAX market alongside better established



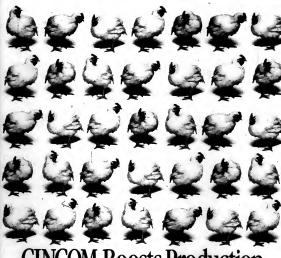


potlight Wouldn't it be nice to have a couple

more terminals on your desk? could eliminate the inconvenience, lost prod ging off and on to different applicational

PARTYNOOM permits multiple terminal seasons to be active or 3270 CRT, under DOS or OB VTAM. The user may welch b the terminal seasons by hitting a PA or PF tay. The termin or in different VTAM-connected partitionshippions. For example, to be a CCS perition or to TSO to do propriat satisful, and that CCS be test the application program being developed. w with 3270 data compres

mentation or free 30-day trial Call for full doors Price: OS - \$5600 or \$280/mo., DOS - \$2800 or \$140/m



# **CINCOM Boosts Production** At Holly Farms.

PROBLEM: Improving programmer productivity in order to reduce a large applications backlog CINCOM SOLVED IT: WILL MANTIS

Application Development System

During a period of plosive growth, Holly ms found itself with two

blems: a large applica-is backlog and a short to step in and produce ediate results. The tion was MANTIS® the application developm system from Cincom®

"MANTIS was ideal for us because you don't meed 2-3 years of experience to use it," explained Bill Clontz, Director of Computer Services at Holly Parms. "It lets us take new graduates, quickly train them and, in a matter of weeks, turn them into valuable

programmers."

As a result, programmer productivity at Holly
Farms has reached an all-time high. "We've seen
substantial improvement ratios," Cloniz said. "In the
time a programmer might turn out one CICS command-level program, he can turn out from six to eight
programs on MANTES."

In Open and Section 2015 In MANTIS Applications now in production at Holly Farms are aimed at struining costs. For example, Data Processing used MANTIS to develop a model of how chickens consume feed over the course of their lives, allowing Holly Farms to cut production at one of its feed mills by 152 days a week

"We've got key users who are picking up on the term "MANTIS," 'Clontz noted. "Around here, MANTIS has become a synonym for 'get it done quickly.'" Find out how MANTIS can boost your produc-

runn of flow man i is can boost your product tivity. Call us today for more product and customer success information. Or, write Marketing Services Department, Cincom World Headquarters, 2300 Montana Avenue, Cincinnati, OH 45211.

1-800-543-3010 In Ohio, 513-661-6000 In Canada, 1-800-387-5914

The Better The Solution, The Better The Value



YES, I want to be the first to know! Please send me 51 weekly issues of COMPUTERWORLD for only \$44.00 — just 869 per copy. In addition, Fill receive FREE bonus issues of COMPUTERWORLD FOCUS. COMPANY

ACONSSS STATE 229

Address shown. 

Home 
Business

For faster service call 1-800-255-6286

Constit Central America & South America \$110/Europe \$165. All other countries \$245 (Armsol) Foreign orders must be prepaid in U.S. dollars. Please complete the information to the right to qualify for this special rate.

#### COMPUTERWORLD



YES, I want to be the first to know! Please send me 51 weekly issues of COMPUTERWORLD for only \$44.00 — just 86¢ per copy. In addition, I'll rec FREE bonus issues of COMPUTERWORLD FOCUS! -

COMPANY ADDRESS STATE ZP

Address shown. 

Home Business For faster service call 1-800-255-62869

Canada - Central America & South America #110/Europe #165 All other countries #245 (Airmsil) Foreign orders make be perpaid in U.S. delians

Please complete the information to the right to qualify for this special rate. COMPUTERWORLD

Clarification (John May Land Control of the Control COMPLETE SHOULDERS (Cree of their signs) Types or equipment with which you are proposed coulomb



### BUSINESS REPLY MAIL FIRST CLASS PERMIT NO. 55 KNOXVILLE, IA 50198-2008

POSTAGE WILL BE PAID BY ADDRESSEE

#### COMPUTERWORLD

PUBLISHING SERVICE CENTER P.O. Box 2008 Knoxville, Iowa 50198-2008

الماطين والطائط الطماط المسالل المسالك



#### BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO 55 KNOXVILLE, IA 50198-2008
POSTAGE WILL BE PAID BY ADDRESSEE

#### COMPUTERWORL

PUBLISHING SERVICE CENTER P.O. Box 2008 Knoxville, Iowa 50198-2008

#### Data Design package weds financial systems

BY NELL MARGOLIS

SUNNYVALE, Calif. — Data SUNNY VALE, Catt. — 1813 Design Associates locked off its new line of analytically endowed accounting software with last week's debut of GL/E, a package said to wed a general ledger sys-tem with financial forecasting

and modeling capabilities.

According to Data Design Vice-President Paul Salagiver, calculation capability built in to the company's general ledger software cuts down on redundancy and increases flexibility. GL/E users are able to do work that used to entail not only exter-nal software systems but also an tional group of users, Sala-

For example, Salsgiver ex-tined, forward pricing calcula-

tions that have to be made in or-der to comply with government reporting requirements can be done with the GL/E calculation module. Similarly, multilevel sales compensation programs and company profitability ana-yses can be accomplished from

within the general ledger,
"Before, all our expense re-porting was done manually," said a systems analyst at a large company division that served as a GL/E beta-test site who did not

With a need to allocate dollars to hours for project work done by each individual in the employ-ee base as well as project codes, overhead and other cost factor "it took a lot of people," the uses said. With GL/E, he continued

from a proprietary programming language based on a what-you-get office research where the same problems in mathematical notation, Hutchison said. The software itself automatically translates the mathematical expressions into ANSI-standard Fortran 77 routines.

Written in C and sup

rd numerical algorithms

mathematical functions and networking and graphics rou-tines, Mathetation also includes Fortran subroutine libraries. Ac-

cording to the vendor, mers then add their own math opera-tors, functions and Fortran rou-tines, using the editor and inter-face to do so easily and

Thus, Mathstation users will be able to protect their invest-

ed by a large colle

Teking care of business
The calculation and allocation
features include the ability to define global allocation rules and
selective overrides that leadin
the time it takes to set up an allocation. In addition, the extend ton. In addition, the executive neral ledger offers there ex-ided companywide control ocifications and the opportuni-

ty to perform calculations within an allocation, storing the results in a master file amount field, ac-cording to Data Design. Trial posting and calculate-only options allow users to test and report results without alter-

ng the master file, company Available immediately on IBM 370 platforms under IBM's MVS, MVS/XA, IMS, DOS, DOS/VSE and Applied Data Re-search, Inc.'s Datacom/DB, Data Design's GL/E is priced from \$110,000 to \$170,000, de-

nding on configuration. ments in existing Fortran while creating new portable Fortran applications, Hutchinson said. The initial Mathstation re-

applications, Hatchinnon said:
The initial Methatation release will run on Sun Microsystems, Inc. Sun-3 and Sun-4workstations. By the end of the
year, Mashatation should also be
available on Digital Requirement
Corp. VAX. computers under
both VMS and Ultrix. A series of
ports to additional Ultria-based
workstation platforms will follow, starting at the end of the
first quarter of 1989, according
to Hatchianon.

to Hutchinson.

Prices for the Mathetation
package, which also requires the
user to have the X.11 version of
the X Windows user interface
and the hardware platform's appropriate Fortran 77 compiler,
will begin at \$9,500, with dis-

Prime 50

Citicorp Information Re-sources in Greenwich Conn. has agreed to market programhas agreed to market program-ming tools made by Aldon Com-puter Group in Oakland, Calif. Citicory will offer the tools to its banking clients that run its Com-prehensive Banking System for the IBM System/38 platform. Aidon claims that its S/Com and S/Compare-Harmon tools cut application upg

James Goodnight, president of SAS Institute, Inc., has reor 3A mactrue, inc., has re-ceived recognition from an un-likely source. He was named Chief Executive of the Year by the International Television Association for his encouragement of the use of videos as training tools both internally and among SAS customers. Goodnight is also fond of using extrav-agant videos to open SAS users

The Oracle data base manage-ment system is available on Con-trol Data Corp. Cyber supermis-icomputers, Oracle Corp.

base management system through French firm Matra

Massoglia & Associates, Inc. in East Lassing, Mich., is offering five publications on the IBM System/36 that provide tips, techniques and training

estimated at \$15 milion. Mc-Donnell Douglas plans to offer its Unigraphics computer aided de-sign and manufacturing (CAD/ sign and manufacturi CAM) software on

Applied Digital Data Sys-tems, Inc. in Hauppauge, N.Y., said it intends to implement the Pick Systems Open Architecture version of the Pick operating version was one of many areas of controversy in the Pick market controversy is the Pick market in recent years. Many Pick is-censees claimed they had al-ready implemented on their own systems many of the features that the Open Architecture ver-

Daquesmes Systems, Inc. said it has made good on a 2-year-old promise of merging two products into one. The systems soft-ware company so, open of the systems of the control of the systems of the system

Electrical Engineering Soft-ware, Inc. said it has ported ware, Inc. said it has ported Precise, its analog circuit simula-tor software, to the Alliant Computer Systems Corp. platform. Meanwhile, Alliant Competior Couvex Computer Corp. said its Ada compiler has been certified by the Ada Joint Program Office.

Cadam, Inc. signed a five-year deal with General Motors Corp. subsidiary Electronic Data Systems Corp. (EDS) to supply GM and other EDS customers with CAD/CAM software. Ca-dam will supply its CAD/CAM software for Unix-based work-

## Mathsoft

The Mathsoft offering is aimed at large industrial, gov-ernmental and academic users who rely on both math and For-tran for calculations, modeling,

erthornatically inclined ie to integrate math, text and sphics, recalculate results aphics, recalculate results on any change and distribute pon any change and distribute emputations across beteroge-sous computer networks, fathstation "brings together and simplifies a lot of what has come a pretty complicated en-ronment for the user who ants to do more work with math and less programming,

#### NEW! Software for INFO/Management If you have outgrown your in-house developed

INFO/Management systems or are about to create your own problem or change management systems, try our proven, integrated applications for one month and enjoy:

- mal data entry
- Quary by example search
   Graphic and tabular reports
- Display of related files
- We also provide INFO/Management applications consulting at masonable rates

Integrated Systems magement Solutions For a free trial, call: (312) 271-5505

· Optimal performance

Highly friendly
 Fixed cost

Exception alerts

Province 24 HOUT CITCS Service (BMI) gave dynamic allocation to CICS....but you need Netec CAFC to make non-stop CICS a reafity, CAFC allows a single command to OPEN or CLOSS 5 or 50 fles. CAFC established two way communication between your CICS regions and you batch jobs. Your batch jobs will always have the flees they nee for processing without operator intervention.

Browse and Archive CICS 1.7 Dumps
The CICS Dump Display Facility gives your support staff inst
on-line and hardcopy access to CICS transaction and syst
dumps. You may view and print any dump without disturb
CICS. CDE archives your dumps for after-the-fact analy.
You may rote dumps to remote locations.



## SIMPLIFY. PROTECT. CONTROL.

Introducing Multi-image Manager. To simplify, protect, and control data integrity, tape drive allocation, and console operation in the growing complexity of today's multiple image or CPU environments.

Multi-image Manager™

Formerly SIS/SDM Products



The efficient, cost-effective way to operate the multiple MVS environments of today is by sharing DASD. tape devices, and consoles. In fact, a majority of all data centers share resources to unify operations, provide backup, and defer hardware costs.

But sharing resources without protection or control dramatically increases your chances for deadlock conditions and data corruption. And physically separating or manually tending to your DASD and tape devices can cut deeply into your shop's productifyty, and your budget as well.

Thousands of financial, manufacturing, retail, government and non-profit organizations, large and small, have decided they want increased productivity without risking the loss of data integrity. They operate their data centers with shared resource management products from Duquesne Systems.

Now there's a better reason than ever to eliminate risk and increase productivity in your data center. Multi-Image Manager combines the performance of SIS\* and the functionality of SDM into one new superset product.

Multi-image Manager offers all the benefits you need for a data center that runs more smoothly, efficiently, and with greater reliability. And that means greater peace of mind for you.

Here's how Multi-image Manager simplifies, protects and controls your operation:

 By providing data set integrity and device allocation across all system images in the complex. This means fewer reruns to repair damaged data sets, and increased availability of DASD and tape drives.

- By reducing complexity and increasing productivity for operations personnel. Operating a multi-image/CPU environment as if it were a single system means lewer decisions, lewer errors and increased throughout.
- By offering the opportunity to reduce costs by eliminating redundant hardware. Sale sharing of resources between images or CPUs means that you can operate more effectively with less hardware.

Multi-image Manager installs quickly without the need to IPL. incurs little overhead, and quietly guards against accidental destruction without interruption.

More than 1,200 Duquesne Systems customers successfully use SIS and SDM. Now you can enjoy the combined benefits of SIS and SDM in Multi-image Manager to simplify, control and protect your data center to its fullest. Call your local Duquesne Systems office, or call toll-free 800-323-2600 (in Pennsylvana 412-323-2600)

\*SIS (Single Image Software) and SDM (Shared Device Management) are two Dequesne System products combined and enhanced in form one new automat product. Made-eroses Management



Two Allegheny Center Pittsburgh, PA 15212



#### It'll Do Wonders With The Economy. crisp, clear resolution. A full-size

The TeleVideo® 905 terminal is a wonder in the world of low cost terminals: a product that gives you more, for less. Just \$409 gets you an ex-

tremely reliable ASCII terminal packed with features other terminal makers charge extra for. There's a sleek monitor case with full tilt and swivel. A 14" highcontrast, super-dark screen with

keyboard with sculpted keycaps. 32 non-volatile programmable function keys. A Wordstar" mode. True accounting-style keypad. Buffered printer port. And, of course, TeleVideo's full one-year warranty.

The TeleVideo 905. It's the very affordable terminal that'll work wonders with the economy

Call us toll-free or write. today, for more information. TeleVideo Systems, Inc. 1170 Morse Avenue, Sunnyvale,

CA 94088-3568.

Call 1-800-835-3228

LOS ANGELES — Phoenix Software Co. has extended its Cygnet fourth-generation lan-giange to include support for IBM's relational SQL/DS in the

In addition to being one of the few products to work with SQL/DS, Cygnet is something of SQL/DS, Lygnet is something of a special case among fourth-gen-eration languages. It can be used to develop a program interacti-vely, with testing and debugging on a line-by-line basis, as with on a line-by-line basis, as with other fourth-generation languages. But a finished system can be compiled to run in batch mode, Phoenits spolessmen said.

The support includes working with SQL/DS in the IBM DOS/VSE environment under CICS and VTAM and with VSE/SP in batch.

SQL/DS is IBM's relat

data base management system and runs under VM and DOS/VSE. Cygnet/SQL supple-ments IBM's Structured Query ments IBM's Structured Query Language, which works with SQL/DS by giving users an appli-cation language in addition to the data retrieval and manipulation provided by SQL, a "retrieval-bi-ased language," according to Steven L. Bender, Phoenix's di-

rector of marketing.

Cygnet with the SQL/DS in-Cygnet with the SQL/DS in-terface version is available im-mediately and costs \$33,000. Cygnet will get IBM DB2 sup-port later this year and is now available for use under IBM's WVS/SP and MVS/KA operating systems, Phoenix officials said.

DOS 2.0 or higher is required for use with SQL/DS. Phoenix Cygnet that works with the VM

#### Weeding FROM PAGE 23

Choquette sast.

This project seems far less glamorous than a move to the much-talked-about AS/400 platform, but Choquette said be prefers to "keep looking reslistically and build (the AS/400) into our plans rather than build plans around it."

etheless, he said be sees the AS/400 as part of the compa-ny's future. He said he was most impressed with the "assurances that the programming environ-ment we know will be main-

trimed."
Choquette, a System/38 green Choquette, a System/38 green for nearly eight years, said he "doesn't think any other system compares to it." He pointed to the editing, compiling and on-line debugging as features that are a big plus for System/38 pro-

#### Cygnet gives | Execucom climbs corporate SQL support | ladder with supportware

AUSTIN, Texas — Execucom Systems Corp. last mosth intro-duced Executive Edge, its first move into the executive support systems market.

ports rely on both text and wh graphical descriptions to illus-trate the causes behind business qua



#### TI's new TravelMate" LT220. It's the closest thing to carrying a VAX" in your briefcase.

the LT220 kap-top terminal — the next best thing to being there when

you need remote access to your company's VAX.

The LT220 provides full VT220 - emulation in a 4.8-fb. package, without scribing functionality, it features a 25-line screen that leasy to read. It even has a full-function keyboard like the one on a VT220.

1,200 or 2,400 bps through one of its optional internal moderns. For hard copy, just slide the LT220 into one of its cetional cradies to add an ink-jet or

thermal printer. New credit-card-stard memory cards



let you create, update and store files. They're also handy for programming They is and manus for programming the LT220 to your specific application. Like its Silent 700° producessors, the LT220 sets new standards for portability, datability and reliability. All of which makes it the perfect tool for anyone whole ever wished for a VAX in their briefcase. In short, this may be the best little terminal in the world. So go ahead. Take the first step toward improving your productivity today Call Texas Instruments for more information or to arrange a demonst tion of the LT220. Phone toll-free,



## Bogert CONTINUED FROM PAGE 23

ord will eventually become one

of the member's permanent history rec-

Tracking considerations
The ability to track a particular member's shodification history is important in maintaining the integrity of a program modification system. This history can be a very limited or elaborate collection of very ammeu or elaborate collection of data; however, the more detailed the rec-ord, the better the chance that someone else — or even the original programmer — can later understand what a particu-lar modification represented.

HE OVERRIDING THEORY behind any system for controlling and tracking program modifications must be based on the cardinal rule: Never allow any

line vehicle for entry of the information you want to track. The program must record for each member as it moves

Therefore, you will need to create the fol-

fied base code library.
Next, assign the person or persons responsible for each library. You will next to establish the appropriate security and modify each person's sign-on to incorporate the appropriate library lists. The establishment of different sign ons to correspond to the different modification is braries can be used in a multiprogram environment to make each program responsible for an individual task.

The modification cycle
To illustrate how the system works, I

will follow a sample member as he pro-gresses through the entire modification

Step 1: The assigned programmer copies the source statement from "base into the library MODLIB. The program mer enters any pertinent information mechanism provided through the track-ing program. The tracking program use this information to create a log record for the member. The programmer makes the necessary changes and then compiles and unit-tests the member. After sucsful unit testing, he passes the me

central unit testing, he passes the mem-ber to quality assurance. Step 2: Quality assurance moves the source code to QALIB. At the same time, it removes the source and object code from MODIAB, thereby ensuring that only one copy of modified code exists in only one copy or monitor code exists in the system. As in each step of the cycle, the tracking program updates the log re-cord. Quality assurance then tests the modified member. If quality assurance is satisfied with the modification, it moves satisfied with the modification, it moves the member to library TEMPBASE (see Step 3: If quality as

Step 3: If quality assurpanc detects a problem, it removes the source and object code from QALIB and places the reject of member is library QAFIX. A programmer, preferably the original programmer of the modification, works on the problem and then compless and unit-test the member. He then returns the member to quality assurance for a rependent of the problem of the problem. The contract of the problem of the problem.

peat of Step 2.

Step 4: Quality assurance then removes the source and object code from
QALIB and places it in library TEMFSMSE. The tracking priorgram updates it
log record to reflect; the move. The inbrary TEMPASE must be placed shee
of all other libraries in production to the
your system will sencotate the modified
members rather than the "base" members.

bers.

Step 5: After sufficient testing in a production environment, remove the source and object from TEMPBASE as place it in your base library, replacing t original, unmodified version of the men

ber. Since implementing our program modification system, we've found it much consist to control the integrity of our existent to control the integrity of our solvention of exist the integrity of our sixth except the control of exist the horseas the unmodified order: there is no cause to run the testing. Because the modifications are throughly tested before the yet must lip robustion, there is less chance of destroying the production, there is less chance of destroying the production flam. Finally, enhanced in centrity results from the seg-registent of the result.

modifications or enhancements directly to the base code.

create and update the corresponding log

through the cycle.

As the member is modified, it is copied or moved to the appropriate library for that stage of the modification cycle.

owing libraries:

MODLIB — the modifications/development library.

• QALIB — the quality assurance testing library.

brary used by quality assurance to store programs that do not meet require-TEMPBASE — the temporary modi-

BMC Software, Inc. PO. Box 2002 - Sugar Land, TX 77487-2002 ☐ Contact me about a 30-Day-Plus
☐ Contact me with more inform the first of IMAGE COPY PLUS.
☐ Contact me with more information on IMAGE COPY PLUS. State Prox \_\_\_\_\_\_\_

#### Faster Image Copies

IMAGE COPY PLUS provides ex-act image copies of your DL/1 data bases much faster than the IMS utilities you are now using. IMAGE COPY PLUS reads the data base der, writes out the image copy er, and aroo asynchronously to further reduce wall clock time. Virtually No Data

#### **Base Downtime** The Incremental Image Copy tea

ture allows you to produce an imag copy without accessing the data base. And the Online Image Copy leature keeps your data be available to users with system response time

#### Reduced Copy Tape Consumption

the amount of data to be writt -further reducing the time nee



#### Systems software

Scientific Computer Systems Corp. (SCS) has enhanced the performance of the Cray Operating System on SCS su-percomputers, the company said. Release 05B of the system reported-

allows users to improve the perfor-ance of their current configuration and so to connect other disk drives to their imputer systems.

ODUCTS compatibility with Cray Research, Inc.'s Cray X-MP architecture. Release 05B runs in both interactive and batch envi-

Release 05B is priced from \$295,000. SCS, 10180 Barnes Canyon Road, San Diego, Calif. 92121. 619-546-1212. ETA Systems, Inc., the supercomputer subsidiary of Control Data Corp., has an-nounced its Unix operating system, desig-nated ETA System V, for ETA10 super-

mpaters.

The new operating system reportedly 
mplies with the System V Interface 
efinition Release 3 and is compatible

with AT&T's Unix System V on CDC's

with AI & I is Ulma opening.
Cyber 910 workstations.
The product supports Transmission
Control Protocol/internet Protocol, Ethernet communications and transparent
file sharing via network file system prototile Energy and Committees are includcols. Fortran and C compilers are includ-

ETA Systems, 1450 Energy Park Drive, St. Paul, Minn. 55108. 612-642-3400.

#### Applications packages

MV5 Supervisor and Data Management Workshop VSAM Workshop ICL/OS Utilities

SMP/E Maintenar Workshop

and Macro Usage Workshop

MVS System Fundamentals Workshop embler Workshop

orkshop

REXX/XEDIT

1-800-233-9521, ext. 1-800-233-5727, ext. 57

amdahi SMART

Computer Solutions, Inc. has intro duced the Growthpower Lot Contro package for manufacturers using Hew lett-Packard Co. HP 3000 series mini

amdahi

The product is said to facilitate the lot control function by enabling users to accommod function by enabling users to accommod function by enabling users to accommod function of the local part from a range of 20-char. alphanumeric lot numbers. Any part may be done or serial-sunders controlled, including components, subassemblies and final satisfactories of the local part of the local pa

229-2200.

An enhanced version of aditis subyles and space censagement of Univer package that rows on Digital Engineers Corp.'s from Demans Software package.

Palamanager V1.1A has been specification of the Corp. and the Co

A program that reportedly will allow automatic marriago of word processing documents marriago of word processing documents and the state of the stat

Shaffetall, 7901 E. 88th St., Indianapo lis. Ind. 46256, 800-248-3475.

#### Development tools

Sage Software, Inc. has expanded its AFS Development Center product offering with the addition of AFS JIDMS.
The AFS JIDMS generator was reportedly designed for developers who prefer generating Cobol or Cobol II source code to using fourth-generation language products and for users with mattlies data base. nangement systems such as IBM's DB2 nd Cullinet Software, Inc.'s IDMS. The roduct will run under IBM's MVS and protect was run usuer than and is competible with several DBMSs, includin DB2, IMS, VSAM and IDMS. Data cor

Dod; into, YoMm ass Dress, Date or manifaction environments apported in-clude BMM a ISPP, CRC and IMS/DC. The APS/DMS system is available as an add-on product to current users for a 500,000 permanent license for. For new customers, APS Development Center Configurations over from \$100,000 to \$200,000 depending on options. Sags Software, \$300 Monarce St.,

**TULY 11, 1988** 



#### Systems education that really works! At last: Hands-on systems education courses

that confer real comprehension, real competence, in all 370 system architectures. Completion of any course lets your people

begin applying what they've learned imme-diately. So you'll see a greater level of selfsufficiency, as well as increased productivity.

Just a few of the courses available right now

include:

## MICROCOMPUTING

MICRO BITS Douglas Barney

## Attention shifts to PS/2 Models 50Z, 70

## Basic

## with cheese?



one here knew, and we became darn curious. So a call went out to Microsoft, and in that compa-ny's typically efficient way, an

of typically emoces, way, as asswer was gotten.

According to Greg Lobdell, coduct manager for the language group, there are three scories. One is that GW stands or Gee White Basic. Another is at it stands for Gates, William t it stands for Gates, William ic, and a third is that it nds for Greg Whitten Basic, itten being a key research i development figure in the crosoft languages group. But odell says Whitten denies that

There is now talk of Kraft ing out with a competitive luct, Cheese Whiz Basic, or now, Gee Whiz it is.

Who wante what? At a ret panel session on the future oftware, I asked folks in the nce how many were sick ired of Microsoft's MS-DOS and wanted something bet-Continued on page 41

#### BY ALAN J. RYAN

Companies looking at Personal System/2 computers said IBM'a latest offerings, the Model SOZ and the Model 70, merit a closer look but that the entries may hurt sales of the original family

After spending several weeks digesting IBM's June 2 announcement of the Models 50Z and 70, some MIS managers said they are ready to begin placing

"They're very attractive now and are good deals if you want that kind of a machine vs. the old-er ones," said Jeff Ehrlich, manager of product technology at General Electric Co. in Hartford.

Prior to the announcement, Joseph Vincent, director of technology planning at Humans, Inc. in Louisville, Ky., recommended the Model 50 as the machine of choice at the mammoth heart of choice at the mammoth heart of successive and the state of users have already started pain-ing orders for Model 502a, which sell for just \$600 more than the original Model 50a.

Tom Jacobs, chairman of the board of Computer Town, Inc., a dealership in Nashua, N.H., said his PS/2 sales in May were quite

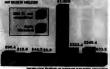
Going 70
Goling 70
Ed Ginorio, manager of customer computing and support at Dan & Bradstreet Information Systems in Busing Ridge, N.J., mitcums in Ridge, N.J., mitcums i

very next 386 PS/2 re comes in, I would get an Model 80 or the Model O'Leary said, because he had enough time to effect evaluate the new box.



#### Data View

PCs are not for play



Firms perch on Microsoft windowsill

BY DOUGLAS BARNEY

If Iraq put the amount of effort behind its war with Iran that Microsoft Corp. puts behind Windows, Iraq would be a much It was not a bost nevertheless, a host of software vendors recently put their stamp of approval on Windows/286.

## How Micro Focus COBOL helped the U.S. auto industry get up to date with Just-in-Time Manufacturing

supports and the major (L.S. automaters). With the release of its STI product, Supply Tech With the release of its STI product, Supply Tech to service the Big 3 automaters' mandates for Exercise Data Interchanges (EDI) software to make Just-in-Time manufactoring possible.

Annis and Jackson agreed that COBOU was the right choice as their development language. When used property COBOU leads inset for self-documentation which

means easier implementation and maintenance."

Jackson, Supply Tech's President and head of product development, was already familiar — and disastified — with another COBOL. But Micro Focus COBOL. had the mainframe COBOL commands they moded. "Micro Focus also offers additional capabilitie via standard routines so that you can do most things in COBOL that you can meanly do only from a lower-leve COBOL that you can meanly do only from a lower-leve COBOL that you can meanly do only from a lower-leve

nguage," Jackson notes. "And no matter how technically phisticated they are, our mainframe programmers just crazy over the Micro Focus Editor and ANIMATOR."

ranzy over the Micro Focus Editor and ANIMATOR Supply Tech we STX12 product is a generic EDI on that is opening up new markets for the company, ductivity increases from Micro Focus COBOL have let it easy for Supply Tech to expand its product line. For the most efficient development of PC gg mainframe programs, call us now.

1-800-872-6265

#### US: 2465 E. Bayshore Road. Palo Alto, CA 94303 (415) 856-4161

UK: 26 West Street, Newbary, Berkshire RG13 IJT (0635)32646

MICRO FOCUS' A Better Way of Programming"



Over 250,000 customers query Cullinet data-bases every day. Now it's their day to query our executives. Announcing Cullinet Executive Man-agement Days.

It's your executive management's opportunity to query our executive management. And get answers about Cullinet's new initiatives straight from the top -from John Cullinane and George Tamke, our Chairman and President, as well as other top executives

Query John Cullingne and George Tamke at Cullinet Executive Management Days.

tant news about me state of culiner, information on products upgraded and upcoming. Plus an advance look at the new Cullinet network computing architecture. Then after under the computation of the comput

tant news about the state of Cullinet. Information

with your key Cullinet tearn.
So respond today. There's a 
Cullinet Executive Management Cullinet executive management.

Bay scheduled for a city near you.

Simply call 1-800-551-4555 to make your reservation. Registration begins at 8:30 a.m.

And get ready to make queries.

Attend. And in the morning, you'll get impor-

Call 1-800-551-4555 to make your reservation. Los Angeles July 18 New York July 25 Dallas July 28 Chicago August 3
San Francisco July 19 Washington D.C. July 26 Boston July 29 Cleveland August 4

SMALL Iulie Pitta

# Mac heads East



has taken on an exotic look with a version running a Chinese operating sys-

e Macintosh II and SE to run ongwen Talk, a Chinese op-ting system with the Mac in erface, has been available te those two personal com-ers became available in por-

ns of the Far East last year Apple says it is boping that publity will allow it to sell Mahes in what market ers predict will become a huge market opportunity for PC manufacturers. The Ameriorecast that China will be the

gest consumer of computer sducts by the year 2010. Apple has been in China ce 1985, nearly two years afer the U.S. government rened controls regarding prod-ts exported to the People's epublic of China. One year after those restrictions were recording to market research m International Data Corp. in Framingham, Mass., sales of PCs in China bit \$420 million in

By the time Apple entered the market the following year, large numbers of those PCs sat tchers say. The Chinese

Continued on page 36

# Wells Fargo exec locks in PCs. seeks bulletproof reliability

Tom Eagan is a plain-spoker New Yorker who says he likes to think of himself as a "get-itdone" manager. His colleag at Wells Fargo Bank NA we ning Eagan ment a \$1.5

amplement a \$1.5
million program to automate the
bank'a 24 branches about 18
months ago — shortly after he
signed on with Wells Fargo.
An MIS executive for more
than a decade, Eagan calls the
Wells Fargo mismatics.

Wells Fargo automation project his finest moment. As part of that massive program, Eagan su-pervised the installation of 700 personal computers at the branch offices and the micro-computer training of the bank's branch personnel.

Not only did it earn him kudos from his employers, but he also collected \$250,000 in California state funding for Wells Fargo un-der the Employment Training

'M NOT convinced of what [the Micro Channel] is or what it does. It's a real 'show-

TOM EAGAN

Act, passed by the state's legisla ture in 1982. Under that legisla tion, California reimburses employers for their trai

able skills.

Eagan, Wells Fargo's vice-president and manager of inte-grated office support systems, recently spoke with Computer-world West Coast senior some dent Julie Pitta about the

hat is your process for lecting a PC? provide services to 700 users, so I'm constantly looking at different kinds of PCs. It's not

ally any strict process. The ings we're interested in are protecting our current technology investments, a good corpo-rate relationship with our supplier and maintaining standards. When we're interested in a

particular technology, we go to our major vendors — Tandy, Computerland and Gateway — and see what they have to offer. Then we go into test mode, We take those products and run them in an R&D laboratory look-

After we finish testing, we take the top three or four prod-ucts and do a corporate analysis. We study the market and see

# Freeze! PC tool draws mug shots

BY ALAN J. RYAN

CAMPBELL, Calif. - When a police to create an accurate com-posite sketch of the perpetrator; victims and witnesses can son times unknowingly be influence

by mug shots and wanted post-ers they may see. ers they may see.

However, composite sketches made within hours of a crime often prove quite helpful to police in their search for the perpetrator. With this in mind, Campbell, Calif.-based Visites Corp. has introduced a software package to help law enforcement

agencies develop more accura composite sketches.

# SOFT TIPS

# Get your record back

Even the best data base jock-eys can accidently delete a If you wish to recover as

accidentally deleted record from within Dataease Inter-national, Inc.'s Dataease, go into View and then press Ctrl

A message will appear at the top of the screen asking

deleted record, you need to know the record number. When you enter the num-ber of the deleted record, the record will appear on the

Press F8 to modify it; this process will also resave the

## Building a better mouse? Microsoft device has scrounged a million sales

BY STEPHEN JONES

REDMOND, Wash. -- In an in dustry where everyone striv to build a better mousetrap, h crosoft Corp. has apparently solved the first half of the equa

The developer claims its Mi-crosoft Mouse has been so suc-cessful that some one million customers have beaten a path to its door since 1986. In fact, sales have more than doubled each 11 Continued on page 36





## PLENARY SPEAKERS

INDEPTH TUTORIALS

in-Depth Introduction to TCP/IP Advanced Topics on the DARPA in TCP/IP for the VM Systems Progra Reduley UNIX Networking Network Management of TCP/IP-4 The Domain Name Southern weeking sent of TCP/IP-based in

RODUCING THE VIP INTEROPERABILITY EXHIBITION

anced Computing Environments 480 San Antonio Road, Suite 100 Mountain View, California 94040 (415) 941-3399, Ext. 15

# Pitta

lacked the training to use the machines and the support me anisms to service them. Purchases of PC products droom

off in 1985 and 1986.

"Apple knew it wouldn't se many Macs," says Apple spok woman Laura Elmore. "They didn't have a product for the market. The Mac they were

speaking users."

The early Macintoshes didn't have the memory to ac-

"HINA hasn't been very good at developing products. They lag about 10 years behind."

LAURA ELMORE APPLE COMPUTER, INC.

ter set composed of the different dialects of the Chinese language. It want the Mac II and SE were introduced last year that Apple could offer systems with the 1M byte of random-scoss memory and expansion alots needed to add the Chinese operating system.

Since those two products introduced last year, App has made special efforts with it Far East customers. Recently, the company reorganized, creating a Pacific Rim marketing group. It signed on two Chinabased distributors last year.

Apple officials led the firm's important third-party developers on a tour of China last year in the hope of interesting them is porting their packages to the Chinese. China has lacked applications software packages for PCs because it has little software

third parties is the fact that C as has three dominant dislect — Shanghaises, Mandarin (si ken in Peking) and Cantonese (spoken in Southern Chima). Shanghai, often called the Ne York City of Chima, and Pekin the capital, are considered to

"China hasn't been very good at developing products, Elmore says. "They lag about 10 years behind. They need it

So lar, Apple a nottware as sidiary, Claris Corp., has adapt Macwrite and Macpaint to Ch nese. Also, Microsoft has intro duced a Chinese version of Ex cel. In addition, Apple is establishing a support struc-

ture of third-party developes China, according to Elmore. Despite the complexity of lenges it faces there, Apple is not prepared to abundon its efforta, "A company's ability to compete is based on three marlets — the U.S., Europe and Japan," Elmore explains, "China falls into the merging market

category. It represents significant business for us."

Pitta is Computersorld's West Con-

Mouse FROM PAGE 35

meeths since July 1986, according to Rich Abel, group product manager for hardware. Abel attributed the sales success in part to a redesign of the Mouse in August 1987. It may sound like the description of a luxuary automobile, but Microluxuary sutcomobile, but Microsoft uses words like "comfort, aesthetics and intuitive ease-ofuse" to describe the \$150 device. According to some sarcastic observers, the most recent

> e sports better aerodys shan any ever made. e crosoft said that during the ix months, it has seen the e's customer base shift p home users to business cusrs as graphics-based applits as graphics-based appli-

cations gain more acceptance i corporate America. Approximately eight out o every 10 Mouse users current

ey, according to Abel.

Although Microsoft is leading the mouse industry, other companies such as Logitech, inc. and Mouse Systems Corp. continue to mibble may at the market.

# Everybody talks OLTP. Tandem does it.

# Microsoft

users plug in more data and allows applications to run more quickly. However, to use this feature, machines must have more than 1M byte of extended memory available.

The product will run on lower nachines but will not prestra 50K bytes of Rake all versions of Windot perform adequately

Leading the applications sarge was Information Buildrs, Inc., which said its next reane of Level 5/PC and expert stem development program ill support Windows.

Lyndhurst, N.J., released software that converts on-line data into complex reports without programming. Dubbed Exec. Reporter, the software sells for between \$40 and \$50. For managing files on a hard disk, Access Softet of Berkeley, Calif., released the 570 December 1997. Windows notables as Aldus Corp., which said Pagemaker 3.0 runs 20% to 30% faster with Windows/286.

Updates of existing Windows ware were pientiful. Winres maven Micrograft, Inc. oped Designer 1.2, a 8695 sonal computer illustration large that rivals Adobe Syss, Inc.'s Illustrator for Apple sputer, Inc.'s Macintosh.

# Freeze!

BM and compatible personal omputers and BM Personal system/2s running Microsoft torp,'s Windows. The original ersion works on Apple Comput-

By using the features of Windown, police departments have a cool they can run on their existing personal computers while incorporating ease-of-use features such as pull-down menus and program control with a mouse, according to Don Summer, presi-

according to Jun summer, president of Visatex.

The software contains more than 40,000 features in a library of facial components and accessories, such as bats, glasses and jewelry. According to Sumner,

ing the package.

To select the proper features
the system incorporates an in
teractive witness interview.

#### Morit bodge "From a law er

of view, the interview proce built into the system is good said Gerald Clough, an investig tor at the Lockhart Police D

Clough said that with noncomputer-based composites, witnesses often select facial features from a whole page of sketched features. "Sometimes they don't have a good recollection but they'll end up choosing something narrows."

With the Windows-based system, the user is not shown groups of features. Rather, the composite is formed through descriptions the witness gives during an extensive interview. Both the interview process and feature images were designed by a police artist based on 10 years of investigation experience in a major metropolitan police department, Summer said.

"In an agency of our six there is no way we could hape forensic artist on stall," Color and, "This provides us with the ability." Priced at \$4,000, til software is certainly less cost those stall-time staller.

# CMS/ MVS

allows users, from within CMS, to access JES2 queues and MVS DASD datasets

(312) 525-6400

# **OLTP** fundamentals.



If you don't have them all you don't have OITP

ON-LINE TRANSACTION PROCESSING is the most demanding discipline in data processing. From small systems to worldwide networks, it requires on-line access to a shared database with full data integrity, full security and no downtime. You must be able to distribute data wherever needed, and it all must operate with the simplicity of a single system you can expand in any increment you choose.

WHO MEASURES UP TO TANDEM? Frankly, nobody. OTTP at Tandem is not a redesign or a retrofit. It's been our business through all the years we've been in business Based on a single operating system dompatible hardware, it comes with excellent price/performance and full service and support. It's also easy to integrate with your existing system.

COMPARE US TO ANY OTHER OLTP SYSTEM. You'll see why companies in every major industry run critical applications on Pandem systems. For more information, write "Pandem Computers Incorporated, 19191 Valloo Parkway, Lo. 4-31, Cupertino, CA 95014. Or call 800-482-6336.

#### TANDEMCOMPUTERS OLTP is On-Line Tandem Processing.

C7112

# IT'S TIME FOR



Isn't it about time you halved your computing costs? And shouldn't your multi-vendor equipment actually be working together?

Isn't it high time you could use your entire information system at the touch of your PC, and had service and support second to none?

Then it's time you considered Hewlett-Packard.

It's time you halved your computing costs.

It's a simple idea.

By creating a computer that works on fewer parts and fewer instructions, it also works on fewer dollars. \*

We call this new approach to computer design HP Precision Architecture.

The chart below shows you just one example of how you can save up to 50% in cost-of-ownership.

This is not statistical "hocus pocus" This is a direct result of RISC-based Precision Architecture.



Our powerful Precision Architecture computers are available right now So now's the time for you to start enjoying their economies.

It's time you had true multi-vendor connectivity.

We know you've made a multi-vendor investment.

If you connect with HP, you can expect the various parts of that investment to work like they were made for each other

How do we do it? With a networking strategy called AdvanceNet that adheres to OSI standards as well as de facto

# HEWLETT-PACKARD

standards like SNA. So it protects your investment.

And with our networking products in over 76 of the top 100 FORTUNE 500 companies isn't it time you also connected with HP?

#### It's time you fully exploited your information system.

Just imagine being able to use your entire information system, through your desktop PC, almost as easily as if you were calling home. And so, make better, faster decisions based on the latest information.

With HP's NewWave environment, you will.

Because it's much more than just an easy-to-use graphic interface. It's a door to your entire system that lets you access, manipulate and share information across applications. From PCs to minicomputers to mainframes, to the furthest boundaries of your system.

The HP NewWave environment. It effectively makes your favorite PC applications, even from different vendors, feel like a single one.

#### It's time you had service and support second to none.

We know that a computer system is not just a purchase it's a commitment. That's why we're committed to giving you the best service and support in the industry.

Our record is based on an average across six key service and support categories in the well-known Datapro survey maintenance effectiveness and responsiveness, troubleshooting, documentation, education and software support. The record?

Number one for five straight years:

Now your time has come. For the kind of computing system that will make your company tick For more information, call 1 800 752-0900, Dept. 2828



# Wells Fargo

ng mean-time between fail-s. We want to keep it out are for two to three years we make problems.

What products is Wells Forgo standardizing on? 28% wastations are Tandy's 28%. Our file servers are AST Fremium Model 80s, which we surchased from Computerland, also 286 technology. We re look-ance at 386 technology, but we arren't made any purchasing de-

ow did you select Tendy? boat a year and a half ago, we oked at five or six vendors as art of a \$1.5 million program to tomate our branch offices, neecting them with our mainconnecting them with our main-frame at the corporate head-quarters. We decided that it had very good price/performance— not the best, but it was very good. That combined with what I left was Tandy's commitment to serving us as a corporate cus-tomer. I actually went to Fort Worth to meet with senior Tandy executives. We were able to negotiate a service deal. to negotiate a service deal.

We weren't convinced by the
Tandy server. It didn't have the
performance we were looking
for. So we went to Computerland
for the AST product.

How are microcomputers being implemented at Wells Farge? They're part of our integrated office support system to provide PC tools to our commercial lend-ing branches at 24 different locaing branches at 24 different locations. The PCs are all connected within the regional offices and are all networked with a 3Com. LAN. Through a leased line, they access our bank's maintaine system, an BBM 3090. They allow loss officers at our branches to conduct lending analysis. We use them to document lons, do portfolio analysis and to communicate lending decisions.

We had stand-alone PCs that were basically clerical machines. There was no penetration into the commercial loan offices.

constrated a productivity ings of 10 hours per month

A more user-friently way of downloading from the main-frame. Our biggest thing is data base administration so we can provide our users with good solid data from the systems. We're developing our own in-hous-are

the 80386 processor.

However, Carrid said at this time, the IBM offerings are inproving but still do not correctly fit her needs. With the Model 70s, she said, the 60M-byte fixed disk is too small to be used

The next generation of desktop computing will let us merge data from different sources into a useful flow of information.

#### Barney FROM PAGE 33

ter, like OS/2. A few hands shot up, but most stayed down. I ther sized how many were sick and ired of Lotus's 1-2-3 and wanttired of Asi

rily so. If

etitors stand to gain m are at Donse's expens

n if all our tes, scraps of p

of paper and pho re on a hard disk ld be backed up on es or tape, but sometis e forget. What we real are fault-tolerant PCs.

ly, this space was used to let Ora-cle tee off on rival Sybase. Spe-cifically, Oracle's Gene Shkiar took Sybase to task for alleged deficiencies in the control of the co

Well, last week we got a call om a Sybase public relations

since SQL Server inn't shipping, yet, Syther really could not comment on Shkin's rements. But come to think of it, SQL Server will be, and a lot of things Oracle said are not true. For example, SQL Server will join files from different server er data base management sys-tems, sust not transcorrently.

tems, just not transparent "The focus is on on-line a tions," she said. "What co

st didn't cut it anymore Again, Sybase couldn't co est but at the same time, could. Users today can upg from a Sun to a VAX withou

changing code, the spokes-woman said, implying that you could just as easily upgrade from a pen Sun to a VAX.

Anyone from Oracle care to

IBM vs. IBM. Add the 1987 revenues of Lotus and Microso together and you'll find these two firms account for more that a third of the total sales of the top 100 PC software firms. But both want more, and each

both want more, and each needs to hart the other to get it.

Lotus's latest secret weapon is Frank King, a former IBM ence who now heads up all software development. King's counterpart at Microsoft was none other than Bill Getes, chairman and vice-consident of monitors.



Metaphor. The next generation.

Your company undoubtedly has tremendous data resources. Metaphor's Data Interpretation System can help you turn them into a tremendous competitive advantage.

Metaphor's system is far more than an incredibly sophisticated, amazingly easy-to-use computer. It's a means of gaining a real edge in the battle for more business, through gains in professional productivity and enhanced business decision-making.

Metaphor is the only system that can give your key decisionmakers direct access to multiple data bases. They will be able to readily transform raw data into meaningful information. And share the results with management and peers, quickly, easily. So decisions can be made in time to make a diffe

Metaphor's system makes a big difference for Information Systems professionals, too, Metaphor lets users build their own applications, so IS managers can turn their skills to more effectively managing the corporate information resource, rather than grinding out user reports and applications from a seemingly endless backlog of requests. And given Metaphor's proven understanding of end-user needs, IS gains a strong "support arm," too.

That's what customers at over 100 installations in the world's largest and most successful companies tell us. They've proved Metaphor's Data Interpretation System is a powerful business tool, giving them an enormous advantage over those who don't keep up metaphor

with the latest technologies. Start the competitive advantage flowing to your company now, with Metanhar, Write us at 1965 Charleston Road, Mountain View, CA

94043, or call us toll-free at 800-255-5803 today

#### Systems

N E

Advanced Legic Research, Inc. has neuproof Flemmede, a 20-MHz Instantion of 80.368-based work of the Advanced Flemmede, a 20-MHz Instantion that reportedly occupies 4%- by 15-miles. The machine was designed with zerowit state page-interferen emmory architecture. R. comes standard with a 15-miles of 15-mil

the CPU card, expandable to SM bytes. On the 80386 system, 1M byte of RAM is standard, expandable to 13M bytes. Flexnode 286 costs from \$1,990 to \$2,990. Flexnode 386 costs from \$3,490

RODUCT

to \$4,449. Price is dependent on memory

configuration.
Advanced Logic Research, 10 Chrys ler, Irvine, Calif. 92718.714-581-6770.

Compulink Mangagement Center has released an integrated document search, update, archival and retrieval sys-tem that uses haser technology. The Laserfiche Model 3000 con-

sists of a 32-bit processor running at 20 MHz with 2M bytes of rundom-access memory. Storage configurations include 340M-byte hard diaks, an 800M-byte write-once read-many optical disk, a 600M-byte streaming tape drive, as intelligent character-recognition optical scan-

gent character-recognition optical scan-ner and a desktop laser printer, according to Computink. to Computink.

The system was designed to replace existing office items such as microfiche, computer data entry, data base management systems, paper copies and faling systems, the vendor said.

The Laserfiche Model 3000 has a price

tag of \$45,000. Compulink, Suite A106, 350 S. Cren-shaw Blvd., Torrance, Calif. 90503, 213-212-6820.

Software applications packages

Computer Associates International, Inc. has released Accepte BPI Ac-counting Lanpak, a package that re-portedly allows multiple users to share ac-

The product will permit as many as eight users to access, edit or view aceight users to access, edit or view ac-count, customer or vendor data simulta-neously. The system runs on Noveli, Inc.'a Novell Advanced Netware and No-vell ELS, 3Com Corp.'a 3 + and IBM's PC Network local-area networks. Accepts BPI Accounting Langels costs

Con

ates, 1240 McKay Drive, San Jose, Calif. 95131. 408-432-1727.

#### 4.025.000 Shares



Common Stock

#### Price \$8.50 Per Share

on request, a copy of the Prospectus describing these securities apany may be obtained within any State from any Underson the property of the property of the property of the property of the thin security of the property of the property of the property of the security of the property of the propert

Goldman, Sachs & Co.

Robertson, Colman & Stephens

Bear, Steams & Co. Inc.

Alex. Brown & Sons

Lazard Frères & Co.

Dillon, Read & Co. Inc.

on, Lufkin & Jenrette **Drexel Burnham Lambert** 

Hambrecht & Quist **Merrill Lynch Capital Markets** 

**Montgomery Securities** Morgan Stanley & Co. Prudential-Bache Capital Funding

PaineWebber Incorporated Salomon Brothers Inc

Shearson Lehman Hutton Inc. Vertheim Schroder & Co.

Smith Barney, Harris Upham & Co.

June 24, 1986

**Dean Witter Capital Markets** 

#### Data storage

NEC Home Electronics, Inc. has made an entry into the compact disk/ read-only memory (CD-ROM) market

read-only memory (CD-ROM) market with the announcement of its intersect line of CD-ROM readers, four interface kits and two CD-ROM readers, four interface kits and two CD-ROM readers come in terrenal tool had beight internal models. The NRC CD-ROM readers come in terrenal kits beight internal models. 77, is BIM Personal Computer XT-AT-AT-D Personal System/2-compatible. It also supports NEC Multispeed Lapton computers and the Apple Computer. Maciation architecture. The CDR-77 conta 5999.

conta \$99.
The Internect internal model, the CDR-80, is a half-neight usir that this in BIM XT, AT and compatibles and in BIM XT, AT and compatibles and in BIM \$70,500 with a standard \$14-in. form-factor mount. The CDR-80 costs \$899.
The NBC CD-80M readers can plag into a compater system using one cost interface bits. Each provides device drivers (PC bits include a small computer systems interface cand. The bits cost \$199 extens \$190 extens \$190

The company has also released two CD-ROM dishs for users of desktop publishing and presentation graphics. The Clip Art 3-D reportedly contains several bosonand three-dimensional images and flower late can be contributed by users, more than 4,000 video images. Each activate package costs \$399.

NEC Home Electronics. 1285 Michael Drive, Wood Dale, IE. 60191. 312-860-9600.

# loard-level

Rabbit Software Corp. has amound a personal computer add-in board set th offers PC-based controller capabilities. The Rabbitchuster board series is di signed to run on IBM Personal Compu-ers, PC XTs, ATs and Personal System

ex., IC XTs, ATs and Personal System/2 Models 25 and 30.

The Rubblichaster reportedly com-bines the functions of an IBM 3270 coaxi-al cluster controller and an ASCII proto-col converter into one two-board add-in-net. The set supports up to 16 attached devices and includes IBM 3299 multiplex.

devices and includes IBM 3299 matupex-er support.

The Rabbitchaster costs from \$2,390 for the two-board set; the add-in boards may be purchased exparately for a price of \$1,195.

Rabbit Software, 7 Great Valley Plwy E., Malwern, Pa. 19355. 800-722-2482.

Accelerate.

# Now there's room for everyone on the fast track.

Compaq introduces the best of 80386 technology for every computer user.







computing.

See COMPAQ 80386 PC, our exclusive assessing component operate at optimate and component operate at optimate of the component operate at optimate considerable odge in system performance, a compatibility with industry-standard tware and hardware, and providing what y well be the ultimate in connectivity for

And now at the top of COMPAQ DSSPRO 385625, The full personal computer available.

With our two newest machines, just pushing 80386 technology forward, widening it. To let every personal computer take advantage of everything COMPAQ States power has to offer.

CON

It simply works better.

Now, breakthrough technology from Compaq brings the power and potential of 8038-based personal computing to millions of business PC users. The first personal computer powered by the new Intel 3865X\* microprocessor, the new COMPAQ DESKPRO 3865 is designed specifically as an affordable, high-performance alternative to 80285-based PC's.

Surrounding its revolutionary microprocessor are high-performance components and a 32-bit architecture that run your current software up to 60% faster than most 10-MHz 80286 PCs. Plus give you the power to run 32-bit software that 80286 PC's won't run at all. And exciting new multitasking software such as

Microsoft\* Operating System/2 from Compaq and Microsoft Windows/386. With its sleek, "small

footprint" design, the COMPAQ DESKPRO 386s takes up far less foom than its competition. But it gives you room for four





So you can easily tailor it to your exact needs. Choose from fast 20-, 40-, and 110-Megabyte Fixed Disk Drive options; 5%-inch and 3%inch diskette drives; even tape backup options.

We give you one full megabyte of high-speed memory standard. And you can expand to 13 megabytes without using an expansion slot. This will come in handy when you're ready to thoroughly exploit the MS' OS/2 operating system and advanced 80386 business software.

We even built features like advanced VGA graphics and standard interfaces for a mouse, printers and other peripherals into the system. This saves your slots for modems, network boards and much more. You'll also find two more standard features: the same sophisticated engineering and uncompromising quality that set all COMPAQ 80386 computers apart. So head for the performance you really need for today's applications. And the 80386 potential you'll need for tomorrow's. With the new

COMPAQ DESKPRO 386s.

Get into the passing lane.

Introducing the COMPAQ DESKPAO 386s. New technology delivers affordable 80386 persions for anyone considering 80286 PCs.



Once again, Compaq introduces a personal computer that leaves every other PC in the dust. With its unsurpassed in the property of the company of the company

Its FLEX Architecture uses separate memory and peripheral buses operating in concert to reach maximum system performance, while maintaining compatibility with industrystandard hardware and software. By splitting the work, they also prevent information bottlenecks in the system. The 25-MHz cache memory control ler keeps date instantly accessible, and that lets the processor teat through applications with 0 wait states 95% of the time. All this translates into performance that's up to 60% faster than most 20-MHz.

tant's up. to solve instant man inch solve the 80386-based PC's.

And, with the optional Intel 387° or Weitek<sup>tox</sup> coprocessor, you'll even be able to match the numeric processing power of a dedicated engineering workstation at a fraction of the cost.

# Now, fasten vo seat b

Introducing the 25-MHz COMPAQ DESKPRO 38625.
The most powerful personal computer available.

You can go from one megabyte of standard, high speed memory all the way to 16 megabyte, high speed memory all the way to 16 megabe, not every speed of the standard of the speed of the three speeds of the speed of the speed of the three speeds of the speeds of the speeds of performance storings. With an every section performance storings. With an every section time as low as 20 milliseconds. Of course, we give you as choice of 5% or 3½° disastic drives and high-capacity top-bookup options.

# Full speed ahead

MS-DOS

Next to high performance, the advantage of COMPAQ 80386 computing is compatibility with both today's and tomorrow's software. From MSDOS' to the exciting new MSOS'2 operating system. And beyond.

Thanks to a close and longstanding working relationship between Compaq and the industry's independent software developers, the

# **NETWORKING**



# Banyan looks hard at OSF



pick up suppor from Banyan Systems, a supplier of Unixbased file server software. Noting that the OSF appea

Noting that the USF appears
to be building on Unix and associated components as a standard,
Banyan President Dave Mahoney suggests that supporting
OSF "looks like an interesting
way of moving Vines (Banyan's

Unix-based network operating system) sheaf faster."
The idea is that Banyan has Unix expertise that might be of interest to the OSF, and should the group develop a standard that could impact Vines, it

the group develop a standard that could impact Vines, it wouldn't burt the local-area net work vendor to have some input in that process. Mahoney concedes there is a slight chance Barren might move to-

concodes there is a slight concodes there is a slight chance Banyan might move toward adopting whatever standard arises from the forum. He also suggests keeping an eye on the company in the next two months as it works to reposision itself for 1989 and 1990. Capabilities to be addressed now that Wise 5.0 is out include new areas of naming and directory services, as well as a strong service when the sum of the contraction of the contract

tory services, as well as a stronger push into data bases.
"We are talking with Sybase and some Unix-based data base companies," Mahoney says, adding that Vines provides an attractive platform on which to your data have generated.

# TCP/IP-to-OSI road has fork

BY ELISABETH HORWITT

Users could find their TCP/IPto-OSI migration courses complicated by the fact that the industry remains divided between
two rival proposals: the U.S. Department of Defense's OSI inplementation Strategy and the
International Standards Organisamation's (1800) Development amiton's (1800) Development.

The DOD's strategy, expected to be officially released this
summer, allows Transmission
Control Protocol/Internet Protocol (TCP/IP) and Open Syntems Interconnect (OSD) networks to coexist but prohibits
mixing the two protocol types on

Kevin Mills, the National Bureau of Standards' (NBS) chief of systems and network architecture.

One reason for this probabito is to encourage users to shift to a complete OSI network rather than inager in a halfway state in which OSI applications run on top of TCP/IP, said Daniel Loych president of American

in which OSI applications run on top of TCP/IP, said Daniel Lynch, president of Advanced Computing Environments Co. and a TCP/IP co-developer. Communications between the two types of networks would

ske place through gatewist would translate between the would translate between the special points of the special transfer Proto of File Transfer Proto (TP) — and equivalent OSI lications, X.400 and FTAM.

areas have developed and are testing such gateways, with specifica tree. tions likely to be released by the end of the year, according to said!

e ISO Development Environment, n provides "glue to plug into a TCP system and run OSI applications, so you can experiment without having to build a separate network underneath," e Lynch said.

The debate as to which approach is better is hesting up. ISO Development Environment supporters claim that the DOD's approach is memory- and CPUintensive, since it requires gateways to support the full set of OSI and TCP/IP protocols.

# System ties both ISDN interfaces

BY ELISABETH HORWITT

EATONTOWN, N.J. — Tele Communications, Inc. recessing introduced the Integrated Apcations Processor 60

communications system to support connections that adhere to both the Integrated Services Digital Network (ISDN) Basic Rate and Primary Rate Inter-

The 64K bit/sec. Basic Rati Interface typically links loca voice and data devices; the Pri mary Rate Interface provide 1.5M bit/sec. connections is

based long-distance net works.

The IAP6000 forms the based two newly associated Pelesystems. ASK300 includes:
AT&T Unix System V, Relea 2 application development en ronnent. With this, users of

concentration, voice/data integration and other functions on the IAP6000, according to Teleos.

For example, the processo could accept transmissions from telephone sets and workstation equipped with ISDN Basic Ratinterface cards and concentrate these lines over a Primary Rate Interface to a bost or ISDN Continued on tone A



outlines groupware. Page 44
o Alles, Microsoft shake
hands on Mac smil. Page 46.
o Potare has SCSI support
for Netware. Page 48.

#### **PURCHASING STRATEGIES**

# You too can buy a T1 mux and live to tell the tale

BY KATHY CHIN LEONG

our company's top management ha gotten the bright idea of saving telecommunications costs by substituting leased T1 lines for a multi-tide of voice/data channels. Commissioned with the tests of finding the right equipment to do the job, you call your lost T1 multiplexer supplier. Then, things star

Ti multipleser suppler: I neu, umays votos get confining.

"What kind of Ti multiplesere do you want' the sales representative asks. "For how many lines? Do you want to integrate voice and chaff flow about vice compressive and want flow about vice compressive confining the property of the property o



..........

# Warning: Bargains can be hazardous to your network.

price is the only thing that matters when it comes to moderne. Our customers feel differently, if you also feel that quality, support and company stability, support and company stability, support and company stability or just as important as price, we offer you our 2400/1200 bps

and rackmounted versions. And if your network is ready for multiplexing, we off our MuttiMux" 4- and 8-channel statistic multiplexors.

our wutterfuck." 4- aird o-cramme seasons multiplexors. MultitModerns and MultiModerns are manufactured in Minnesota by Multi-Rich Systems (as they have been since 1970), and provide exceptional quality at an economic price. If you are not alrea Multi-Tech modern or mux user, ple call us toll-free today, at

1-800-328-9717.

MultiTech Systems

MuMI-Tech Systems, Inc. • 82 Second Avenue S.E. • New Brighton, MN 55112 • (612) 631-3650 • (600) 328-9717 • FAX 612-631-3575 • TWX 910-563-3610

# Package helps coordinate jobs on networked microcomputers

#### BY ALAN ALPER

TRUMBULL, Conn. — Coordination Technology, Inc. recently outlined plans for software said to help users coordinate integrated tasks located on microcomput er networks. The groupware package is slated for release next summer.

Coordination Technology's p will provide a framework that tion Technology's pack work groups through the most effective means of completing jobs, the vendor said. It will also facilitate the transfer of information between co-workers on networked micros and provide automa

Our aim is to shrink the amount of coordination effort to allow users to have more time available for the execution of

ir tasks," said Roger Moody, the com-

come in two pieces: a shell to manage uting resources and a compo map out the interactions of the work

group. Users will be able to run e automation packages such as Lotus De-velopment Corp.'s 1-2-3 within the coor-dination environment, the vendor said.

OS/2 support
The package will be developed for networked Intel Corp. 80286- and 86586-based micros running IBM and Microsoft Corp.'s OS/2 multitasking op-

Software platforms to be supported in August 1989 include OS/2 with Micro-soft's LAN Manager, 3Com Corp.'s 3+Open and IBM's OS/2 Extended Edit

tion with the Lan Server, according to Co-

ordination Technology.

The package will be written in the C language, which provides ease of porting to other hardware and software platforms. The company said it expects to rease versions for Digital Equipm

UR AIM is to shrink the amount of coordination effort to

allow users to have more time . available for the execution of . their tasks."

POCEP MOODY 1

COORDINATION TECHNOLOGY, INC.

Corp.'s VAX/VMS and Apple Computer, Inc.'s Multifinder.

Inc.'s Multifinder.

Office automation analyst Amy Wohl;
said Coordination Technology's approach
is similar to other procedural processing
products developed by companies such as
Metaphor Corp. and Filenet Corp., which attempt to coord rate group activities toward a known end. Coordination Technology has laid a good framework, Wohl said, but it re-

nains to be seen if the company will supply generic applications or provide tools for users to develop applications to unlock the power of its coordination environ "I liked what I saw, but I'd like to

#### TCP/IP CONTINUED FROM PAGE 43

Another potential advantage of the ISO approach, according to Lee Laburre, lead engineer at Mitre, is that it allows users to find out for themselves the greater functionality they can get from OSI appliole. OSI FTAM all

For example, USET LIVES AROUND ACCORDING TO INCIDENT ABOVE ONLY TRANSFER OF Whole files, La-

The NBS's Mills responded that the DOD approach also enables users to ex-periment with OSI functions without having to scrap their nider TCP/IP networks. It also encourages users to "buy full OSI protocols instead of home-brewed R&D hacked-up things," be added.

No shoo-in So far, there is little indication that the DOD strategy will automatically become the standard — even for government or-

The National Science Foundation, for example, said it prefers the ISO approach. This is because it enables users to experi-This is because it enables users to experiment with the newer ISO applications while preserving "all of the standard [DOD-based] stuff people are familiar with" on the lower networking levels, according to the foundation's Director of Networking Steven Wolf. "When people are comfortable, we can alide the TCP out from underneath and substitute ISO," be

Fortunately, several vendors have re-vealed their plans to provide gateways that incorporate both the DOD's and the ISO's recommended approach, so users should be able to choose their migration



"Look, I understand why we need to connect your network to my IBM system; let's just make sure the software we choose doesn't affect next week's payroll run."

You've been told the IBM MVS bost and SNA system you manage must be connected to engineering's TCP/IP network. But which package offers both sets of users the features they want without compromising your ability to manage system resources? Which package?

#### ACCES/MVS from ACC.

With ACCES/MVS, TCP/IP users are subject to the same security constraints as your IBM users. No need to worry about unauthorized tampering with files or resources. You can tailor TCP/IP users' access to the applications they require

ACCES/MVS installation is simple. You won't need to change the operating system or develop new software. Once installed, ACCES/MVS only minimally impacts the CPU Your system continues to perform the way you want it.

#### ACCES/MVS is the accepted standard for integrating SNA and TCP/IP networks. Because it satisfies their concerns, MIS managers for large manufacturers, government agencies, and university computer centers have chosen ACCES/MVS.

And ACCES/MVS uses bardware interfaces fro ACC or other vendors. For more information on the software package that has the features TCP/IP users want and meets your criteria too, call ACC today

Advanced Computer Com 720 Santa Barbara Street Santa Barbara CA 93101 (805) 963-9431



## T1 mux

FROM PAGE 43

aliae that this isn't going to be easy as you thought. Relax. The following descrip-Kelax. The following descrip-tions of users who have success-fully purchased T1 multiplexers should help clarify your task. But first things first: You've got to know what you're looking for.

at is a T1 multiplexor? A T1 multiplexer is a commu cations processor that takes lo-cal transmissions from voice and cal transmissions trum
cal transmissions trum
data devices and passes them
over one or more 1.5M bit/sec.
Such a device should

once otherwise and passess used to the characteristic and the charac

There are commercial T1 tandards for dividing a 1.5M it/sec. line into 24 (Pulse Code fodulation) or 48 channels Adaptive Differential Pulse code Modulation) Modulation), but ma lors tend to use proprietary

roice/data compression techques that squeeze every unable ece of bandwidth onto the line. Thus, the technology has not en standardized to the point at which users can mix and match different vendors' multiplexers

on a T1 network. According to David Owen, director of product marketing at Stratacom, Inc., while T1 multiplexers can all support the Bell interface stan-dards to tap a T1 line, "the upper layer protocols are not standardized, and that's why you have to

Three who've done it Clearly, choosing a T1 multi-plexer is no easy task, but three users — Westinghouse Electric Corp., Travelers Insurance Co. and First Interstate Bank of Washington — have ample experience in T1 networking, and each found vendors well suited to their needs.

A product that adhered to the

Bell interface standards was crit-ical when Westinghouse made its multiplexer decisions. Westing-house was a pioneer in implementing voice/data integration across digital T1 lines in 1983. When the Pittsburgh, Pa.-based company decided to venture into company decided to venture into an all-digital voice/data commu-nications environment, that meant the first-generation ana-log Aydin Corp. multiplexers, which had limited proprietary

which has smuted propressary features, had to go.

Westinghouse's selection of 13 CP 2000 multiplexers from DSC Communications Corp. in Santa Clara, Calif., followed ex-tensive in-house market re-search. A proposal was submit-ted to the Westinghouse ted to the Westir Standards Committee, gave DSC a thumbs-up.

In the decision-making pro-cess, Westinghouse wanted to adhere to commercial T1 stan-dards, particularly ADPCM, the

Telegraph.
Jim Sever, Westinghouse's

ager of networking engineering of communications sys-tems, says, "We needed a vendor that would be very flexible and which had a product that conformed to different pieces of quipment," such as the various local-area networks and mais

ponents of the company's puter systems — including frames. And since Westinghouse has more than 200 T1 trunks, built-in redundancy was also piv-otal in the selection routine.

otal in the sesection routine.

The move to integrate voice and data has been a boon for the company. Sever says. While 20% of the traffic over T1 links is data and the rest voice, he says the company plans to increase facsimile and video traffic in the ext few years.

next few years.

Despite the pluses associated with DSC, Sever readily admits to certain features that are lacking. For one thing, the multiplexier does not support Group III standard facsimile machines, on which the company has stan-dardized. Second, the product's network management support does not extend to other venors' equipment as required by estinghouse. While standards were key cri-

while standards were any cre-teria for Westinghouse, speed and reliability topped the list at Travelers. The Hartford, Conn., ITSVERTS. The PIRTUON, Com., insurance company has begun to install 11 Network Equipment Technologies, Inc. (NET) Integrated Digital Network Exchange (IDNX)/20s, NET's change (IDNX)/20s, NET's smallest time-division multiplex-er. According to Tom Calabrese, Travelers' assistant director of telecommunications, 70% of the T1 backbone network is used for with the remaining 30%

In late 1986, when Travelers was looking for a series of multi-plexers to replace its point-to-point General Datacomm Systems, Inc. devices, the company established several criteria, Cal-abrese says. The insurance firm needed a product that, in case of circuit failure, would reroute data and voice calls to another circuit in less than 30 seconds.

circuit in less than 30 seconds.

Travelers, which has 20 T1 links, also required built-in redundancy, dynamic bandwidth allocation and strong technical support. According to Calabrese, NET's IDNX box is able to isolate problems within the multiplexer so that the rest of the network is not affected. In addition, the device can auto-matically reroute calls without preprogramming. While the dy-namic bandwidth allocation fea-ture is common today, Calabrese

says few vendors offered it is 1986.
Like Westinghouse's Sever,
Calabrose has his own wish list
for further multiplexer enhancements. Redwood City, Calif-based NET sells a network management tool called INGS that
runs on a Sun Microsystems, T1 or not T1?

AT&T Accumet T1.5 Users Group By invitation only Contact: Local account executive

Digital Communications Associa c/o Class Mathettan Bark 13th Ploor One New York Plans New York, N.Y., 10061 (212) 676-3041 Contact: Victoria Blackford, vice-per

Independent T1 Users Group Associati P.O. Box 7514 McLean, Va. 22101 (703) 734-7056 Contact: Karen Dickson

work Equipment Technologies Pus Purchase Rud wood City, Call. 94063

t: Lyn Coyle, NET user lisison ratacem Fantpacket IPX Users Gro-United Stationers O E. Golf Road

Different motives
While network configure

management features were a top priority at Travelers, First In-terstate of Washington in Seattle needed a multiplexer that could

ccessfully support integrated ice and data.

Stuart Browne, vice-presi

specializes in packaging voice and data over T1 lines. The bank has invested \$300,000 for four

"We did a one-year analysis to determine what to do with TI be-fore we got into it." Browne re-calls. Prior to leasing the lines, the company ran separate point-opout voice/data networks. While the company's services subsidiary, Fine! Internate sub-tional control of the company of the recommended Time-pers, Inc. multipleores, Browne says, that is 1986, at the time "We did a one-year analysis to

says unit in 1990, at the time these decisions were being made, the Timeplex devices seemed as though they were be-ing used more as data multiplex-ers than for voice.

Des Plaines, IL 60016 312) 899-5000 Contact: Bernie School seider, vice-president, cor \* This beautid being of Til man errors

Browne is pleased with the ability to configure the Strata-com IPX Fastpacket network nodes into a ring architecture, a design that saves T1 lease costs and gives each node an alternate route in case a line goes down.

Since the IPX Fastpacket from Stratagon offers a 4-to-1 Inc. Sun-4 workstation. Cala-brese says he would like to see NET port INCS with IBM's Net-NET port INCS with BBN's Net-view net management system to an IBM Personal System/2, since Travelers is an IBM shop. Calabrase also says that a supports fewer than 10 lines, for example — would be an asset to Travelers. The company may be able to bring a single T1 line into a small branch, be agar, and give those users the same advantages as those in the bone office.

Since the IPF Festpacket, from Stratzon offers a 4-b-1 conforcession acheme, that meant First Interestate could obtain up to 96 voice chamels per II trusk. This, in turn, sparse the beast from lessing more lines than necessary. And in case a II line fails, the multiplearer can give critical data priority in determining which problems get a proper company must transmit IBM Systems Network Architecture. Synchronous Data Link Control. bisysochronous and asynchronous brat Link Control.

bisvachronous and asynchro nous data across the same line While other vendors' multiplex Stuart Browne, vice-presi-dent of communications, runs a statewide T1 network that sup-ports various bank branches. This year, the bank installed multiplexers from Campbell, Calif.-based Stratacom, which ers tend to support only a few formats, Browne says that with the Fastpacket technology, it does not matter what protocols are used to send data or voice across the wire. "The fact that the nodes are protocol-transpar-ent saves me a lot of headaches,"

he points out.
In the next three years, the bank is expected to save \$1.8 million in transmission costs thanks to Fastpacket, he adds. Even so, there were risks in ne-lecting Stratacom, since it is an independent and relatively small

independent and relatively small company. Before First Inter-state decided to select that com-pany, it performed a thorough check on its financial visibility and spoke to existing users, in-cluding Intel Corp., Chevroo Corp. and Hewlett-Packerd Co., all of which reported success

# Before you buy

o avoid calamity when buying T1 multiplexers, consultants and network managers interviewed by Computeraved offer the following tips:

Examine network traffic patterns. Do not simply count the circuits. Determine the distance of the lines not how much you can sive see how much you can sive ng T1 lines.

using II lines.

Determine what hardware, software and selivating protocols the II multiplenar must support. II devices come in both protocol-dependent and -independent variation.

Find out how much voice and data traffic will be out the selivation, both ower and in the future. Be realistict; you do not want to spend more on a super-delume model when a medium-size one will fill the hill.

one will fill the bill.

Find out about another products such as higher or lower and
multiplears. As your corporation grows, your needs for expending IT lies may follow. Your multipleare verdor should
be ready to offer situation tools for large and small footstons.

As a streamed supposed across the country, network, manage-ment products are becoming increasingly important. And since
most vendors are pleasing and to the network management beauting
many large size—to acrossine the features offered by each
surgar, make size—to acrossine the features offered by each
surgar, make size—to acrossine the features offered by each
surgary.

Talk to other users, particularly those in the same field or king requirements. KATHY CHIN LEONG

# Third-party support rampant for DEC, Novell

Communications Machinery Corp. (CMC) amonomed the availability of WIS TO/IP Release 3.0 for WAX and Microvax computers. Used with CMC's ENP-40 Qbas Ethernet processors, the new software reportedly allows DEC users to interoperate with a wariety of dealton devices that support Transmission Control Protocol/Internet Protocol (TCP/IP). It includes network-national control and control protocol/Internet Protocol (TCP/IP). It includes network-national conducting, a star-few in manifest of the Computer of the Co tical monitoring, a standard user in-tical monitoring, a standard user in-ter, a University of California st sley Unix 4.2 Socket Library and an acced version of CMC's Simple Mail fer Protocol that supports VMS mail

More TCP/IP support for DEC users is available from the Wollongoog Group, Inc., which has enhanced its WIN/TCP for VMS. The product is said to allow VMS users to create gateways to other TCP/IP environments consisting of multi-

provided is the shillty to monito memission media and adjust the in on flow to maximize throughput stures, enhanced file transfer promisi sentures, enhanced file transfer pro-tocol for all VMS file types and multiple shared-device drivers asait to support up-to eight standard DEC Ethernet inter-faces. Pricing starts at \$2,000 on a Micro-rax and \$8,000 on a VAX.

St. Louis, Mo.-based McDonnell Doug-lass Manufacturing & Engineering Co. mid it will recell Network Re-search Corp.'s Fusion network soft-ware for VAL/TMS systems to customers seeking to integrate DEC and Unit-patietrum using TCI/PI. In addition, Net-work Research said it has signed an OSM contract enabling it to bundle Pasion 3.2 with the Corp. In the Corp. In the Corp. In the Corp. In the Parison Digital Corp. In the Pasion 3.2 will be a present Digital or resid as Parison Digital Corp. In the Corp.

Novell, Inc.'s Netware environment has picked up more support in the last month. Relational Data Systems, Inc. in Corte Maders, Calif., said Revision 3.31 expands its PC/VS software support to Netware.

In addition, Mitsubishi Electronics merica, Inc. in Torrance, Calif., said

Novell's diskless PCterminal is currently available through Tech Data in Clearwa-ter, Fis., which has purchased Novell's entire domestic inventory of the product Novell claimed, to have sold 35,000 PCterminals.

now able to purchase a network interface driver for 3Com Corp.'s 3+ network operating system. In addition, Allen-Bradley amounced it has licensed No-vell's System Fault Tolerant Netware Version 2.11 for use with the Vista LAN/PC.

none year year of the control of the

Can your nc network pass this simple test?

#### Keefe FROM PAGE 43

software while running SQL, for exam-ple, on the front end. As for OS/2, client upport will he out early next year, but Banyan has not yet decided to sup ther Microsoft's LAN Manager or Named Pipes, Mahoney says.

Goin' gangbusters. Dataquest, a mar-let research firm based in San Jose, Calif., recently looked at the U.S. revenues of 35 suppliers of LANs. Of the 35, only two vendors showed a decline in revenue -Sytek and Coryus, The other 33 LAN es showed revenue increases aver aging 78.5% between 1986 and 1987.

So we changed our minds. The tim-ing of Corvus's recent decision to file for bankruptcy profection under Chapter 11 took at least one network analyst by surprise. He rang up the LAN supplier surpruse. He rang up the LAN supplier about a month ago in response to rumors that the company would be going Chapter 11. "They said there was no way the were going Chapter 11, that they had a strong belance sheet and a strong cash position," he says, adding, "I don't like belank at the part of the property of the pr

Corvus President Joseph Rooney ys he doesn't know who the analysi talked to but noted that Corvus's cash position "has never been that strong."

After the most recent efforts to secure additional funding failed, the decision was made to file for Chapter 11, he says. As-

suming Corvus pulls out of its financial woes, users might like to know that the company is planning an IEEE 802.2 version of Omninet and will also make the network "more compatible" with IBM's Token-Ring and Ethernet, Rooney says. Corvus is also a licensee of the LAN Man.

RISC-y business. Data General signed an OEM deal with Motorola back in April, promising to deliver a product within 12 months. The product in question is a Unix- and RISC-based client server, according to market researcher International Data Corp. Unlike a traditional network server, this box would serve ap-

cations and users. Banyan is the hot candidate to pro-

vide Unix on the server, but head-honcho Mahoney says, "There is nothing signed or agreed to." While the specter of the OSF AIX-based Unix attentative may throw a kink into these plans, DG's official stance is to remain committed to sup-porting and running "standard" Unix

Still waters run deep. Quet though it may be, Proteon is busly working on a number of projects these days, according to Proteon investor John Bayless of Sevin Rosen Management Co. Count on the token-ring manufacturer to have a rendy answer to IBM's 16M-bit Token-Ring bub, with both products expected to

Ring bub, with both products expected to he released around November.

Also possible is a Micro Chamel ver-sion of Proset 4. And you can expect to see a big increase in Protose 6 DEM business as more and more system voto counter IBM's networking punch, the in-vestor adds. Wash for joine amount-ments in the next two months.

\*\*Declaration systems in 100M-bit Filer

ments in the next two months.

Proteon's interest in 100M-bit Fiber Distributed Data Interface-based networking is well known, but one amust ing rumor currently making the rounds he Proteon polling back from low-spee networks and working on a 500M-bit ne work.

The investor confirms, however, that Proteon is taking a hard look at Integrat ed Services Digital Network to see what value-added opportunities that technol-

ogy would provide

# System ties

service. Teleos plans for ASK300 to sup-port a standard software library that is currently being developed by the National Bureau of Standards' ISDN Implemen-tors Workshop, Teleos product mañager Howard Fiderer said.

Howard Fiderer said.

The library will define standard calls for software developers to ensure that ISDN applications can run across different vendors' implementations of the networking standard, Fiderer added.

The ASK200 system can ensuiate a carrier's ISDN central office switch, all coving users to develop and test Basic Rate applications even if a local ISDN services not available. Teleon said.

Rate applications even it a local SIDN ser-vice is not available. Teleon said.

The ASK200 can support up to 72 Bu-sic Rate or 18 Primary Rate Interfaces or a mix of the two. ASK300 supports up to 68 Basic Rate or 17 Primary Rate Inter-

faces or a mirr. Price of the IAP6000 starts a

\$12,500, the ASK200 at \$37,000 and the ASK300 at \$56,000. All are available im-DISOSS

Find out what's in your DISOSTE bray and PS/OCS document pool.

Reports on all documents
 Runs while DISOSS is active

SMF accounting records
 Free 30-day trial

TB

# Simple Test

Does your network provide for both wide area and local

2. Does your network pport point and Ethernet

3. Is your network able to

L. Can you easily add

If you've discovered your netk should contribute more, et lest, and be less time conning, the ComDesign Group N.E.T." has some great news vou: The SPX" family of roducts can help your present eta network. Or, once you ee what the SPX can do, you ary even want to trade up your

ntire network.\* We designed the SPX espeially to adcommodate different cations, speeds, protocols or local and remote sites into a single, efficient network. The SPX omes out of the crate ready to pass the toughest test of

all: reality. Best of all, our ENA Network Manager gives you the power. visibility and control to fine-tune your network and to handle

inplanned events comfortably Test drive an SPX network

on your PC. There's an easy way to find out what our unique approach could do for your application. Take a test drive in the kind of vork you could build with our SPX/ENA family and see

now it handles Simply call our hotline and ik for your ver of our et Drive

me disk

800-235-6935. Ask for

Our clients are winning."

NETWORK EQUIPMENT TECHNOLOGIES ComDesign Data Communications Group

# NEW Local-area netwark hardware

A CCITT X.25 packet-level boars for IBM Personal Computer buses and Per-sonal System/2 Micro Channel PCs and

min systems must be common to the property of the property of the property of the property of the product is said to be targeted at a vendor's multinational customers are product is said to be targeted at e vendor's multinational customers to are currently developing private or rbrid X.25-based switched networks. Called the PCpath X.25 Packet, the ard will reportedly support access seeds of up to 19.2K bit/sec. and offer

software support for the IBM X.25 Apolication Program Interface and Icot's ver-sion of that interface.

PRODUCTS

The PCpath X.25 Packet will cost

\$595. Software will be priced separately. Icot Network Systems, P.O. Box 91395, Mobile, Ala. 36691. 205-633-3270

Laçal-area netwark saftware

Future Domain Corp. has announced the availability of small computer systems interface support for Novell, Inc.'s Aded Netware 286 Version 2.1. The

Novell 286 2.1 Driver will reportedly allow users to interface up to six disk drives on multiple channels with simulta-neous and concurrent I/0s.

a ore urriver is available as an upgrade or to new users as part of Future Domain's host adapter kits. Complete kits include host adapter, cable, software and manuals and cost from \$289. The driver is available as an a

A Novell Advanced Netware 286 driv er upgrade for current users has a price of

Future Domain, 1582 Parkway I Tustin, Calif. 92680, 714-259-0400.

An IBM 3270 terminal emulation and file transfer package for IBM Personal Com-

puters and Personal System/2s has been

announced by Quadram Corp.

MLB is designed to support Quadram's Mainlink II line of micro-to-maindram's Mainlink II line of micro-to-main-frame boards and reportedly permits a PC-to emulate an IBM 3278 monochrome or 3279 color display terminal. The emula-tor can be memory-resident, and access to DOS may be obtained via hot key ses-ations. The product is said to be fully com-patible with IBM send-end-receive host and the polarization of the product of the MLE roses 8150. MLE roses 8150.

MLE costs \$150. Quadram, One Quad Way, Norcross, Ga. 30093. 404-923-6666.

#### Modems/Multiplexers

Microcom, Inc., a software-based workstation connectivity firm, has un-vicied its QX series of protocol moderns, which reportedly achieve throughout rates ranging from 12K 1030K bit/sec.

The QX/12K is a Microcom Networking Protocol (MNP)-based CCITT V.22bis-compatible modern that is said to be compatible of the control is said to be capable of a 12K bit/sec. throughout rate over standard dial-up

The QX/30K is an MNP-based V.29 FT-compatible modern with a throughput of 30K bit/sec., and the QX/V.32C is a dial-up V.32-compatible unit that can de-

liver a 38K bit/sec. maximum throughput over standard telephone lines. All QX series modems are available in stand-alone or rack-mount versions and are computible with the vendor's existing AX rack

The QX series costs from \$799 to Microcom, 1400 Providence Highway, Norwood, Mass. 02062, 617-762-9310.

## Diagnastic equipment

Two fiber-optic laser sources to be used for testing single-mode fiber-optic cables have been announced by Fotec, Inc.
The S360 and S390, designed for

The \$380 and \$390, designed for 1,300 and 1,550mm wavelength outputs respectively, are especially suited for testing in-feeder and subscriber loop environments, according to the vendor. They are available individually or as part of a Fotoc T330 Central Office and Local

Loop Test Kit. The S380 costs \$2,250, and the S390 costs \$3,250.

Fotes, The Schrafft Center, 529 Main St., Box 246, Boston, Mass. 02129, 617-241-7810

# OS/2 networking

An IBM Personal System/2 Micro Chan-nel-compatible facsimile board has been introduced by Quadram Corp. The board is based on a 4.8K bit/sec. chip and can reportedly convert an IBM PS/2 Model 50, 60 or 80 into a Group III-com-

patible machine.

JT Fax PSJQ comes with menu-driven software and operates on a terminateand-stay resident basis. The product functions with Hewlett-Packard Co. Scanjet
and Chinon-America, Inc. N208 scanners
and supports Brother International Corp.
and Epson America, Inc. printers with

aphics capabilities.

JT Fax PS/Q will be available in the third quarter and cost less than \$600. Quadram, One Quad Way, Norcross, Gs. 30093, 404-923-6666.

# UNIX SYSTEM · 'C' · PC

#### VIDEO-BASED TRAINING

UNIX System Courses UNIX System Executive Perspective UNIX System Overview

UNIX System Fundamer w Edito Unix System Shell UNIX System V Internal

'C' Language Courses
'C' Language Programming
Advanced 'C' Programming PC Courses PC Primer

Running MS-DOS DOS for the Power User otus 1-2-3 drase iii Di. Multimate Word Perfect

Displaywrite and many more

e. Please call the



#### SEMINARS

ONX System and "C Language Public Seminar offerings include LPNX System Chemistru LPNX System Fundamentals for Non-Seminary Commental LPNX System Fundamentals for Non-ser's Command Language, Stell Programming, Advanced LPNX System Comments, LPNX System Administration, LPNX System Internals, C Language Programming, Advanced C Programming Workshop, Advanced C Programming under CPNX On-site seminar and custom-tailord seminars are site on-elable.

UNIX System public seminars will be presented in seven oties throughout 1988: Washington, Chicago, Los Angeles, Boston, San Francisco, New York, and Dallas. For your 1988 schedule, please

#### SOFTWARE

MKS Tooliet, which provides 386/lx Product Family, which includes: UNIX System V 3 Run time VP/ix, multi-user DOS under UNIX TEN/PLUS User Interface

Software Development Systi Text Processing Workbench

Reseller programs are available for both video-based training and software To order, or for your free product catalog, call

(800) 323-8649 or (312) 987-4084 COMPUTER TECHNOLOGY GROUP ge. G. 60604 105 Merhan

TIPM a s person restorate of affile.

# SYSTEMS & PERIPHERALS

HARD ALK

Stanley Gibson .

## Total System, total control



ocessors, IBM played to its one suit: taking care of all ssible customer needs. The Total System Packages The Jotal System Packages clude a processor, with an op-ating system already loaded, gether with standard memory and disk configurations. The otal System Lease option in-

nance and tied it more closely to the products themselves. The AS/400s come with a modern to

rly, IBM wants to sell a totality, not a list of items, each of which is a commodity that which is a commonly that be easily compared with opeting items. It wants to up its total offering in a pitch office on that will beat ev-

rone else — something that it s traditionally been able to This trend flies in the face of the notion that users have be-come more and more intelli-gent and discriminating in recen years and are way beyond one-

op shopping with hand-he rown in. But are they?

stomer profile hybe the best answer in that the are and some aren't. Many inframe customers have the or and expertise to pick over a ndor proposal in detail. Many after users, particularly small

businesses, do not.
While the packaging offered
by IBM may be seen by cynics as
a way to establish account control, if a user wants and needs a
vendor to make such packages,
how can one suggest that IBM is
not acting in the customers' interest by selling them?
However, the Total System
Package also runs concentually

age also runs conceptually ounter to the open systems novement and to the much bal-

# SIAC takes stock of its systems

Nerve center revamped to avoid Black Monday pitfalls on stock exchanges

BY ALAN ALPER

NEW YORK — Black Monday might have been a dark moment last year for Wall Street, but it caused the bright light of public curiosity to shine on the computer systems that run the si

Securities Automation Corp. (SIAC), the nerve center of the nation's stock trading, handles computer operations for its joint owners, the New York Stock Exchange (NYSE) and the American Stock

(NTSE) and the return to the control of the control

10 EXPENDITURES IN BULLIONS

ings that slowed processing to a crawl during Black Monday's record volume of 608 million shares traded on the NYSE. "If a 600 million-share day occurred now, it could be han-ded with style and grace," said SIAC President Charles Mc-

The upgrades, according to len Kroll, vice-president of de-lopment for switching and or-r processing at SIAC, included

the following:

Swapping Tandem Computers, Inc. TXP processors for faster VLX boxes with increased disk storage for its Limit System, the system that handles limited price

**Data View** 

got bogged dewn during Black Monday. This modification in-creases the number of copies of the core table that tracks cancel-lations in the program. • Making a number of copies of its Limit System changeable

overnight so revisions no longer have to be entirely rewritten.

• Changing the control program on its Designated Order Turn-around (DOT) system that auto-matically reacutes high-volume program trades. This modifica-tion will allow large queues to built in semiconductor memory rather than in disk, speeding sys-rather than in disk, speeding sys-

rather time to dait, specding sprint throughout the mit broughout person and the property of the person and the

# **Fujitsu** Customer service spending forecast or espenditures are espected to increase at an averag of 11% annually through 1992

# upgradės Pick lineup

BY J. A. SAVAGE

SAN JOSE, Calif. — Expanding its offerings in the Pick Systems operating systems market, Fu-jitsu Microsystems of America,

One system for 10 users, one One system for 10 users, one for 64 and another for 96 were sandwiched into Fujitsu/s Pick lineup. Pujitsu uses its own version of the Pick operating system, which it says it has en-

ing, terminal support and graphics. The systems, which are slated to be available next month, are based on different processor reasons of different processor reasons of the support support of the support and costs 58,500 for that configuration. The System 2400/Model 60 XF is based on the Motoroid, at 20 MHz. It costs 325,000 and support 54 Uses.

Continued on page 53

Lasergraphics designs film recorder for mini, mainframe users. Page 54.
 Memocra Telex expands 3270-type line with display stations. Page 54.

# Arix ties Unix line to quote system

Arix Corp. announced that Standard & Poor's Corp.'s Trading Systems will resell the Unix-based Arix 800 series, designed for 30 or more users, with Standard & Poor's Stockmate

Systems Ltd. worth \$12 mi-lion during the next three years. Manneamann will sell the 800 series under its Series 9400 la-bel. Mannesmann offers a legal package at well as packages for printing, factory automation,

construction, banking and fi-nance. The firms are in the pro-cess of porting Mannesmann's applications to the Arix hard-

Convex Computer Corp. in Richardson, Texas, has agreed to sell Chromatics, Inc. color graphics displays.

The Chromatics CX2000 Color Graphics Display System is capable of one million two-dimensional vector/sec. The dis-

y comes in two version

Filenet Corp, in Costa Mesa, Calif, said it signed a five-year, 84.1 million agreement with the state of California for an image and data processing system. In our control of the cost of

lending institutions in California

Control Data Corp. recently installed a Cyber 955 computer a Volkswagen AC's research and development facility in Modelace, More Germany, as part of a major upgende of the Power amounced they will be excited power amounted the products and services to the excited power amounted the products and services to the excited power amounted the control of the excited power amounted to CDC Orber constitute you will be on CDC Orber constitute you will be a constitute on CDC Orber constitute you will be a constitute on CDC Orber constitute you will be a constitute on CDC Orber constitute you will be a constitute on CDC Orber constitute you will be a constitute on CDC Orber constitute you will be a constitute on CDC Orber constitute you will be a constitute on CDC Orber constitute you will be a constitute on CDC Orber constitute you will be a cons

# IDMS/SOLAND KNOWLE PUNCH THAT KNOCKS

In the fight for greater performance and pro-

In the fight for greater performance and productivity, you don't want to enter the ring with anything less than the most powerful database and tools available to you.

For your VAXI<sup>th</sup> from Digital Equipment Corporation, they're IDMS/SOL1 and Knowledge BUILD From Cullinet. The most powerful VAX database available, combined for the first time with the most powerful, according to the first time with the most powerful. complete toolset. Building on each other, without compromise to efficiency or

flexibility.

Consider the facts



Among the database products available for production-strength applications, IDMS/SOL beats the competition in the most critical areas.

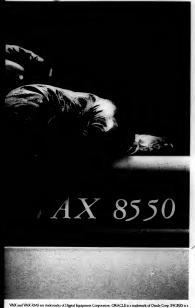
Take transaction processing speed. In an online, multiuser environment using the TP1 benchmark, IDMS/SOL is on average three times faster than the competition. And only IDMS/SQL combines modular, high-perform-ance architecture with features like compiled queries, and bulk data access, delivering high transaction throughput.

#### PERFORMANCE/THROUGHPUT Compiled Queries Hashing Bulk Data Acces Save Points Priority-based Deadlock Res IDMINIOL ORACLE INCRES 2.6.



IDMS/SQL and KnowledgeBUILD are trademarks, and the Cullinet logo is a registe trademark of Relational Technology, Inc. Copyright © 1988 Cullinet Software, Inc. urk of Cultimet Software. Inc

# EBUILD: THE ONE-TWO THE COMPETT





There's no obstacle to maintenance, backups, restructuring or archiving. All can be per-formed without bringing the system down as a result of IDMS/SOL's 24-hour availability as a first in VAX databases. And only IDMS/ SOL gives you dual journalling and automati online recovery to ensure full data integrity, without user intervention.



KnowledgeBUILD accelerates IDMS/SQL's KnowledgeBUILD accelerates IDMNS/Clis productivity by combining menu-driven form and report painters with non-procedural speci-lications. Through its powerful program gen-eration capability, KnowledgeBUILD creates efficient, compiled COBOL and FORTRAN applications that work with all your data, whether IDMS/Cli or VAX RMS<sup>NI</sup> files. And KnowledgeBUILD's simple, yet flexible reporting facility gives end-users easy access to ormation.

Give your VAX the extra punch it can only et with Cullinet. Compare the features of get win Cullinet. Compare the readures of "DMS/SGL to those of your current VAX database, or any you might be considering. To find out more call or write Cullinet Software, Inc., Marketing Services, 400 Blue Hill Drive, Westwood, MA 02090-2198.

Call Cullinet today about an IDMS/SQL seminar near you. 1-800-551-4555.

# Gibson

FROM PAGE 49

ommitted. ix has been called "the

Unix has been called "the user's revenge," in that it tends to reduce hardware, operating systems and application software to commodities. If this is severate to commodities, if this is nevitably going, then IBM and other vendors have said they will

I-course meed sever, in introducing the priciary OS/400 operating tem and Total System Packa, IBM is about as far away in the open Unix extreme as possible to get. Its success in viding soup-to-muts will any at about what users really at

BM is clearly hedging on its ket position in its support of x, as are most vendors that ns using proprietary environments in ada systems using proprietary crating environments in ad-ion to Unix-based systems. M and these others, DEC is ded, have adopted both open a and secrecy at once.

vices.

IBM's Total System Packages show that it is going back to its roots. It wants to be a supplier of machines and services to increase productivity, not a com-

ter company per se. After partitioning itself ag the lines of different rchitectures and risking ing "just another compu mpany" — or worse, cor as — IBM is currently re-- or worse, com ping itself to mal

Value-added edge
And IBM coald carry over the
total systems approach to the
Unix market as well. This
would give IBM a key value-added edge over Unix systems ven-

Indeed, a key question for Unix vendors, after they have reduced themselves to a common denominator of an operat-ing system, will be how to offer ang system, was be now to other something more than raw com-modities. Aiready, those ven-dors are scrambling to come up with the special plus they will be able to offer that the other

nx vendors won't. Those vendors may find emselves comp

Gibeen is Computerworld's tor, systems & neroberals.

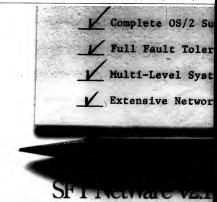
#### SIAC FROM PAGE 49

This allows specialists on the trading floor to electronically enter trades and receive confirmation via a display terminal. SIAC expects to have all major stocks on electronic books in the near future, which will cut down on card printing.

In the meantime, the firm added more card printers and readers on the trading floor to handle manually instituted trades as the transition to elec-tronic bools continues. These electromechanical devices were unable to keep pace with the vol-ume during Black Monday's slaught and cause

On April 30, SIAC tested one systems that experienced fliculty on Black Monday. Live sta from Oct. 19, compressed tivity. This truncated approach forced SIAC's systems to handle order and peak message rates that were about 45% and 53%

To be sure, SIAC plans mother test, Since no day reasembles another — even if volume in equal — SIAC said it will conduct a test in the fall to evaluate how its systems landle the stress of a different type of 600 million-share day. This in being done because typical trading activity comes in peaks and villeges and affects SIAC's systems differently; Black Monday was



MIS-conceptions about

Traditionally, the MIS world has viewed PC-based local area networks with a healthy dose of skepticism. A "prove it to me" attitude And in an arena ruled by powerful mainframes, that approach has given rise to a few misconceptions and doubts about LAN

Well, doubt no more. Because with the industry standard SFT NetWare v2.1, Novell

offers the LAN software powerful enough to convince even the toughest MIS skeptic. SFT NetWare v2.1 gives you the features and functionality of mini/mainframe systems at a fraction of the cost. With extensive fau tolerance, security and LAN-to-mainframe connectivity, it makes LANs advanced enough for major corporate, government and education installations.

No other LAN software even approaches the level of fault protection and data security built into SFT NetWare v2.1. Novell has pioneered LAN fault tolerance, and provides protection from failures in server hardware. In addition, enhanced security locks and words give you complete control of the information stored on your LAN.

01988 Novel Inc., World Hendquorters, 122 East 1700 South, Flove, Utah

characterized by heavy volume, McQuade explained.

All systems go
"I don't think that test will prove anything different," be said.
"We will test the common measage switch, and that didn't really flinch on Oct. 19."

ty has returned to th

ne company wants to ensure it in process volume that is supply 50% greater than reent peak levels. It does not sant to get caught by surprise as was list October, he said, then studies showed that peak saily volumes would not exceed

"We had only one 300 mil-

Friday preceding Black Monday), when 336 million shares were traded and the market was down 95 points," McQuade re-

The company aims to boost its capacity to handle a one billion-share day during the next 18 months, McQuade said, "We will add new Tandem boxes that offer more processing and do a major resurting of DOT and I insist to

combine them into one environment," he said. This will occur as SIAC pre-

This will occur as SIAC prepares for a new Brooklyn data center that will be situated across the East River from lower Manhattan headquarters [CW, Sept. 1967]. Both data centers will operate as primary sites, McQuade and, which itself thould Centaur II grows up

NEWPORT BEACH, Calif. — Data Voice Solutions Corp. recently enhanced Centsur II Mini, its multiuser, multiprocessor business system, to support up

to 28 simultaneous users.

The system allows ASCII te
minals to run Microsoft Cor
MS-DOS-based applications u
der Novell, Inc.'s Advano.
Netware Version 2.1.1. The pr
vious Centaur II Mini support.
Novell's Advanced Netware
Version 2.0A and could handle:

many as 14 concurrent uners.

The Centaur II can be used at a stand-alone departmental computer or can be used with existing minicomputers and main frames, according to Charles Spencer, the company's produc

manager.

The updated version office
628M bytes of disk storage as
an optional 32-bit intel Con
90386 file processor. The prev
out Centaur II model came wit
133M bytes of disk storage as
was offered with an optional is
tel 80286-based file processor.
The Centrum II Minis identification.

The Centsur II Mini is house in a 19-in, chasels. The systecosts \$25,000 for a typical fivprocessor configuration the supports more than 20 users.

supports more than 20 users.

Previously purchased Ce taur II Mini systems are field users and produce solid cradable the worder solid.

# Fujitsu

The 10-user Systé 2110/Model 50 is based on an I a 100/Model 50 is based on an I a 100/Model 50 is based on an I el Corp. 80386 "process clocked at 16 MHz. It repia two earlier models, the Syste 2000 and the System 2020, the company's entry-level system; those older systems cann be upgraded. The System 2100/Model 50 for 10 users

Fujitsu's Pick systems as port the company's Comm Network Architecture. Acos ing to the company, the architecture allows connection of computers in a local-area a work, and it can link IBM Psonal Computers to the Pick new



Printed Componers in the me

# pport

ant Capabilities

em Security

k Management Controls

# pates to rescure LAN performance. STREET 2 and the second of the second

SFT NetWare v.l. a simplifies a network management with mean-timen utilities that let you control the network from any wrateriors and the network from any wrateriors and the network from any wrateriors and the network resources. Available communications links give you unsurpassed concentivity with mind/mindrame systems and other IANs. And SFT NetWare v.2.1 supports OS/2 as well as DOS workstations.

To get LAN performance that raises your MIS standards, get the LAN system with no doubts about it—SFT NetWare v2.1. See your Gold Authorized Novell Reseller, or call 1-800-LANKIND.

For more information, call from your modem 1-800-444-4472 (8 bit, no parity, 1 stop bit) and enter the access code NV217.

NOVELL

For network solutions, you should be seeing red.

# Graphics systems

sergraphics, Inc. has intro-ced the Lasergraphics Film scorder (LFR), which was ed to provide minicomp

The recorder is capable of generating a 4,000-line slide for corporate presentations without image or color degradation, the wendor said. The unit supports virtually all graphics software packages that output Hewlett-Packard Co.'a HP Graphics Lan-

D

guage. The LFR is connected to the computer through the Laser-graphics Rascol III stand-alone rasterizer, an independent mi-crocomputer. An IBM Personal Computer or compatible version is also available The LFR with the Lasergra-

phics Rascol III costs \$12,950. Lasergraphics, 17671 Cowan te., Irvine, Calif. 92714. 714-

#### Data storage

### 500M-byte Winchester disk

system designed for large, tiuser environments has a announced by Data General Corp. The vendor claimed that the product features up to a 250% formance increase over ex-

ing subsystems running on the

family of computers.

The Model 6581-A disk drive includes 500M bytes of tted, error checking and correcting data protection storage with a 16-msec average seek time and a 6.5-msec average roal latency

A burst multiplexer channel controller, the Model 6580, is so being offered by DG. The unit can reportedly support up to eight 500M-byte Winchester disk drives. The packaging was designed to allow up to 1G byte to be stored in 7 in. of vertical

high-end and mid-range DG MV

The Model 6581-A subsys tem costs \$22,000. The Model 6580 costs \$7,000. DG, 4400 Computer Drive, lestboro, Mass. 01580, 617-

#### Terminals

#### Memorex Telex, Inc. has ex-panded its IBM 3270-type product line with the addition of sev-

The 1191A and 1191B are reportedly basic-function 12-in. reportedly basic-function Leville monochrome displays with a choice of either amber or green 1,920-character acreens. The units offer 88-, 102-, 104- and 122-key keyboard support and are listed at \$1,235 with a three-

The company is also offering the 1191D and 1191E 14-in. nonochrome display units. Key-oards are available in 88- or 122-key configurations, and the units cost \$1,395 with a oneyear warranty and \$1,425 with a

Two color display units, the 1091C and the 1092C, were also added to the product line. The 1091C has a 12-in. monitor and is said to support seven col-ors. It costs \$1,745 or \$1,895. The 1092C has a 14-in, monitor with a 1,920-, 2,560- and 3,440-character screen and is available for \$1,845 or \$1,995. Pricing depends on warranty options.

Memorex Telex, 6422 E.

41st St., Tulsa, Okia. 74135.
800-331-2623.

A multitasking graphics terminal has been announced by Mod-graph, Inc.

graph, Inc.
According to the vendor, the
GX-2000 is a 15-in. high-resolution graphics terminal that can
perform a variety of functions simuttaseously. The uset offers a
resolution of 1,024 by 780 pixels
and can emitter the Textroxit.
Inc. 4010 and 4014 graphics terEquipment of 102 by 780 pixels
and can emitte the Textroxit.
Inc. 4010 and 4014 graphics terEquipment of 102 by 780 by 780
graphics of the GX-2000 can either
printed, transmitted or examinate
printed, transmitted or examinate inted, transmitted or exam-ed in parallel. The display is railable in amber and green. The GX-2000 costs \$1,295.

Modgraph, 149 Mic Tnpk., Burlington, 01803.800-327-9962.

# How to Buy Time for Your IBM 308X.



### 1. Invest in EMC.

With the uncertainty surrounding IBM's next move in the mainframe area, adding a few more years to your system's productive life will pay dividends for you down the road. So why buy a new system, when EMCs main storage upgrade why buy a new system, when BMCs main storage upgrade gives you the performance you need to make your current system your future workhorse. With EMC you save 30% over comparable flux upgrades, With means boying time now for your 300X has never been a better decision. The simple 'plug and play' design of EMCs upgrade makes improving the nce of your system as easy as adding sand to an

#### 2. Maximize Your Savings. EMC uses state-of-the-art technology and production methods to offer our 308X upgrade at 30% lower cost than

IBM. A 16MB upgrade from IBM is priced at \$160,000. For 24 that same price you could buy 24MB of EMC main storage. That's an additional 8MB of main storage or a savings of \$50,000. Either way you save with EMC. EMC also features coterminous eases and trade-up credits so the return on your

3. Improve Performance.

By increasing your 308X's main storage capacity, nove system response time and increase your users city, you will

investment continues

EMC a 308X upgrades are 100% hardware and software compatible with IBM 3081, 3083, and 3084 CPU's. Upgrades are provided in 16MB increments and run all IBM diagnostics. Use of EMC upgrades will have no effect on your IBM.

#### 4. Add Reliability.

To guarantee the most uptime possible for your 308X system, our upgrades use pre-tested logic components. Then they are subjected to 100-hours of test and burn-in procedure which include qualification in one of our own 308X

EMC is the leading independent man storage upgrades and other system enhanc mainframe and mid-range computers. All mainframe and mid-range computers. All EMC products for mainframe and mid-range computers. All EMC products are supported by our worldwide network of sales and service offices.

#### 5. Call EMC.

If you're interested in buying time for your 308X sys-call EMC today at 800-222-EMC2 for your free informatic Our 308X upgrade is the 'midlife kicker' that saves you money and improves your 308X's performance.

For more information, call today: 1-800-222-EMC2 ext. 2290 (In MA, call 617-435-1000)

The System Enhancement Company. ISM is a repreced trademark of base Correspo 1987 EMC Communica

# IN DEPTH

# All your assets on-line

An 'information factory' provides end users with the ultimate in data access and purity

BY KEN SLOAN

hen Rob Harmon we chosen to head the Marketing Information Systems department of the Honor Systems department of the Honor Hon

oped and operated systems — Bell of Pennsylvania, New Jerse; Bell and the Chesapeake and Pu tomac Telephone Companies. This task was not an easy one

After divestiture, the new con pany, Bell Atlantic, was forms from six analier divested Be operating companies. Information critical for planning an week-to-week management hato be made available to the maagers now responsible for all six companies' combined opera-

The previously existing info mation systems had been adquate within their home compnies. But none of these system could consolidate all the variou data formats while retaining the intended data meanings with the new context.

Something completely new was needed. Harmon's answer he Marketing Integrated Data tradysis System. Using that sysem, Harmon's department conolidated pre-existing systems

Different groups collaborate on standards and implemented cost-effective system that mad critical information readily avail

Sions is president of Sions Software Services, Inc. in New York, consulting is innovative software products and strategic information systems. He is the for mer manager of data hase product renearch and development at Applied Data Research, Inc.



created what is ca mation factory."

Makes the job easier An information factory

An information factory is an emerging technique for information resource management. Its premise is to deposit and maintain — on-line — all pertinent information with full history retention. An information factory

veis. Instead of seeing just immary data or averages for a ser or a month, analysts can ok at the actual data and base

ground.

Although the particular terr
"information factory" may no
come into common use, a num
ber of leading companies — in
cluding Bell Atlantic. America
Airlines, Citibank NA, Banku

Mart Corp. — are implementing systems of this type. Data integrity and consisten-

factory. In the Bell Atlantic case, the value comes from the explicit agreement—across systems on standard data item names, representations and meanings. Data items can be transferred and still have the same meaning.

regardless of context.

When assembled, the information factory becomes the definitive management information source. Unlike other corporate data bases, which often include only production data, this particular data base gives and users access to archival data,

mate. Even a few years ago, such a dea would have been considere moneside. Physical storage an etrieval software were simple to up to the challenge. But to lay, the dramatic capacity in reases and cost reduction nake an information factory eco

dissing on

organizations today believe are fully exploiting the mouse amounts of data they accumulated. In most enises, only summary or parnformation ever moves outformation ever moves outfirst captured the informa-

I has means that to under stand or analyze the information a user must go back to the production application data base. I the user needs historical data, is unlikely that the production data has been extraord the data.

An enterprise using the information factory approach can access the detail level of the organisation's functions rather than attempt to manage from just attempt to manage from just approach a contract. This is a

- Manufacturing-style data management
- Bell, American Airlines, Citibank jump in
- Added value: Integrity and consistency

Row materials
The gas into a supersition factory

All the gas in the gas in the supersition factory

All the gas in the gas in

DIFFORMATION PROVIDED BY SLOAN SOFTWARE SERVICES, DIC CW CRAFE

context.

The same "management-by-the-numbers" thinking can be used in loan analysis, insurance loss forecasting, customer servicing, manufacturing quality control and government services.

Or consider this analogy, of when you are trying to ford a wide, muddy river, are you interested in the average river depth, caverage current speed and average, current speed and average, bottom composition? Per-

haps. But if that is all the information you have, you may have a rough crossing. What you really want to know is the shortest, safest place to cross the river.

Compare and contrast

Compare and contreas!
In addition, the data base name,
formats and structures almost
always differ from one application to another. This makes data
synthesis or comparison across
applications very difficult. End
users are really limited to using
data for the purpose envisioned
when the data was first automated.

Users generally cannot pull
data from a variety of historical
sources because once a data item.

has been removed from its original application, interpreting it correctly is difficult.

If a data item cannot be correctly understood, it cannot be combined with other information

ve a los management toois do not estable address the problem. The discourse of the control of th

Current generalized informs

the improved decision-making capabilities they provide. By making connections between data and its interpretation consistent, an information factory can add this value. It makes different systems' data like different national currency. A form of currency has value where it originates but must be translated outside its issuing country. The more widely understood data is as negotiable information, the more valuable it is.

An information factory acts as a filter so MIS can accumulate information and develop a way of managing mixed systems that retain the data's content and make it consistently available and valuable to end users.

Factory functions
The information factory has four functional components: the enterprise information base, the enterprise information directory, the data conditioning system and the information presentation

system. The sectorprise information. The sectorprise information and the memory of sixt in a relational data management of the production application system is relationally as the production application system is The six in sector of the production application system information authority on the sector of the production application systems will not clearly represent "work in process." while some other propers information base contain edited and soldied data in minimation audited data in discontinuation and interest and

tion directory defines the dist stored in the enterprise information base, including the nume, edit rules and formats for data. The directory can be implemened as a commercial data dictionary or as extensions to the DBMS catalog. The enterprise information directory contains the name and structure mapping between various data sources and the enterprise information base's accepted internal format. In addition, it controls the data conditioning process. The mappings are invoked by the data conditioning system when data is entered into the enterprise information base.

The data conditioning

formation base.

The data conditioning apparent is collection of processor and the processor of the control of

The information factory ap-The information factory apment of the property of the proport for separate production and the procells and solid data. However, many times production systems have been distributed across multiple locations and have been implemented in the distance pass or by other parties. Therefore, it is impossible to ensure that edits and sudits are performed at the first processing point. Data must be re-examined before being looded into the enterprise infor-

The information presentation system is a collection of user interface products that lets authorized and users access information in the enterprise information system uses mappings of ilises when call user request information is a non-standard format. There are a range of commercial products for micros, minis, workstations and mainfarment that can be said and inside that can be said.

# up current justed and viewbottom composition of the Instead, it is just that pollution. IBM and Other Computer Equipment .... For Lease, Buy or Sell.

# BUY/SUBLEASE SELL/LEASE

3090-ALL MODELS 3090-200/300E/400 3084/3081's 3084 Q-96 4381-ALL MODELS 4381-P2

4381-ALL MODELS 4381-P2 3380/3880-3 (HSN) 3380-E/D's

MERIDIAN
HARDHWARE
CENTER

MEKIDIAN

Suite 300 570 Lake Cook Road Deerfield, Illinois 60015 1 312-940-1200

CALL TOLL FREE 1-800-426-3090 • Ask for Jim Leman

3274-ALL MODELS

# Pumping data

he MIS namager at a major West Cone bank needed to cue in on the 90/20 walk to which his staff has seen fancing. "Instead o pending 90% of the time us g the information, we were providing that mount of time only the profession of the data," he says. The solutions are informed necessary that perform proprets extract services US now acts as the centre.

oking for the data, "he says, character of the solutions are information factory that performs on factory that performs propose extract services. US now exits as the contrait of loads most of the beak's solution during the computation data color a Territoria of the contrait of loads most of the beak's solution data to describe the contrait of the contraint of the contrai

tioning process. The data is "scrubbed" and standardized before it is stored. The assurce data recession

 to provide access interactively, on a ma-mitted program basis or on a program-to-program basis. The product MIS chooses ogram basis. The product MIS cho il dictate how the information prese m system selects data, how it pres n system selects unter, acceptata, ta and how users can analyze data. An information factory makes inform

ion quality a line responses..., tion applications are still planned and im-plemented. But more and more, these

plemented. But more and more, these systems are the responsibility of the organizational units that need them. The fundamental information factory policy is to determine whether the information at hand is of current or future enterprise interest. If so, it is passed through the data conditioning system and into the enterprise information base. This policy parallels the normal financial action of the property parallels the normal financial ac-

sobcy parallels the normal financial ac-counting policy used by most firms. Part of management's job is determin-ag what data on what schedule will be noved into the enterprise information use. Once this has been decided, every plication's processing routinely trans-s data through the data conditioning stem to the enterprise information se. For the sake of audit balancing, a

base. For the sake of audit balancing, a common strategy uses a synchronization point — hourly, daily, weekly or mosthly less continuous updates are required. Affect the information factory is in place, new production applications can for-cutions will pass the acquired date to the enterprise information base as a normal hy-product of the processing cycle. The information base are not applied to the control of the processing cycle. The information base are not applied to the control of the processing cycle.

# Not the same

How big would your information factory be?



# **Why We're Betting** a Million Lines of Code on the SAS/C Compiler.

At SAS institute inc., we've invested more than 10 years of research—and over a million tines of code—in the SAS® System, the world's leading data analysis software. So you can bet we left nothing to chance when we chose

of our soreware.

We selected C for the portability it would bring to the SAS System, but weren't about to risk our code on just any maintrame C compiler. So we tried them all. When none could meet our

# We Developed It.

## Support It. Use It.

# Test It. Compare It.

FREE for 30 Days.

Using a C version of the Divystone benchmark, the latest SAS/C compiler slease produces the fastest code among the top 3

tion. We'll also sand you a free copy of a leading benchmark program. Com-pare our complex with any other. Odds are, you'll choose the SASIC compiler. Just mall the coupon below. Or call your Software Sales Representative at (919) 467-8000.

We're betting you've set the same high standards. That's why we'd like INC. SAS Circle But & SAS Circle But



I'd like to put the SAS/C<sup>III</sup> compiler to the test with a free 30-day trial, and my free copy of the Dhrystone benchmark program. Give me the details. Please complete, or attach your business card.

Company			
Address			<u>`</u>
Dity	State	7	
eleptore			CW11AL88

Cary, NC, USA, 27512-8000

#### Assets

FROM PRECEDING PAGE

concerned with the hypothetical "now." If you update data in a data base, you lose the data value in the position you updated. In contrast, the information factory is cumulative. Time becomes a qualifier on a query. The enterprise information base is well saided to address time-series in-mirisa horsupes it retains historius and the properties of the properties of the properties of the properties information base in well saided to address time-series in-mirisa horsupes it retains historius horsupes it retains historius horsupes. quiries because it retains histor-es that production systems have

ionally neglected.

Impanies that implement
mation factories do so betheir production applicaanayses, in the assence of such an intense, top-down need, it is unlikely that an information fac-tory will be successful. The polit-ical travals of crossing bound-aries aside, the financial

ical travals of crossing bound-aries asside, the financial difficulties of cost justifying new computers and disk storage may be too much for the project. Ton much planning will also kill an information factory. The reason: It involves a lot of poli-

ottom heavy rmation that a typical Fortune 1,000



lyze all corpo

tics, some up-front technical confusion and considerable re-education about an organiza-tion's information. If an attempt is made to answer every objec-tion before moving toward imementation, the project will be towed to a snail apace. Remember that complete

Remember that complete analysis of an organization's data normally takes years and is nev-er truly complete. If the first in-formation factory task is to ana-

Pick a project big enough to pay back the investment but small enough to be reasonably accomplished within six to nine months. In most organizations, there must be some concrete payback for this kind of new an-

then be assured that success will be elusive. Instead, meet the in-formation need that drives the first project. Make that a suc-cess, and then build on it.

proach before the next budget cycle or funding could be lost. Use what software is already available. Data bases, dictioavailable. Date to the control of th

Possible disadvantages
A large project like this can severely strain the data storage
and management demands of
even a very large mainframe

figuration. In some cases, an rmation factory may free up a space that had been used by ak space that had been used by production application or an in-rmation center, but this is not e usual case. This has led some ms to invest in front-end data se machines as their plat-

forms.
The other option is to support an information factory through special software. IBM has done the research, design and development work for Enterprise Systems Architecture (ESA). Apparently, IBM anticipates that

future applications will include more information than current applications, especially in his-torical detail data. ESA will be a platform on which even enorcould be supported in a tre

facturing style era. This chan is the equivalent of an industrial revolution: It is based on the mass production of interchange-able parts and components, each

For most companies, infor-mation manufacturing is still at the handcrafted level. The vast majority of data is still only intel-ligible within that system — like connected angeable, handmade our parts that have no use be gum parts that have no use be-pond the particular gus for which they were fabricated. With suffi-ciently high payback now poesi-ble and massive storage and re-trieval systems moving to within reach, we may begin to see a chicken in every pot and an infor-cession future in. mation factory in every Fortune

# Unisvs/

With 8 megabyte to 1 gigabyte capacities, RAMdisk is a better value for I/O performance than disk. Terrific cost-per-megabyte compared to main memory. And unlike main memory, RAMdisk travels with you when you move to another system. Backed by Unisys/Burroughs



800-622-5020 Ext. 261

Burroughs users don't need to change

to a bigger mainframe.

Memories of the future 630 Alder Drive Milpitas, CA 95035

In California (collecth (408) 946-9400 Ext. 261 FAX: (400) 262-4754 TWX: 910-334-0547 TLX: 171607 ZITEL SNJ

# Regional answer

tine, chances are the ine, chances are the agers at Bell of Pennsyl-a and the Chesapeake and mac Telephone Compa-need the name thing. This solution, of course,

has its own set of problems. While the goal may be a the operating companies. Thus, Rob Harmon, Bell At-lantic Corp.'s marketing in-formation systems director, 

ner data tog We wanted customer reve-me, billing information, prod-

place," Harmon says.

The project team wanted to create a relational data hase within which the user could get to any data elements and them sort, select or mix and match to mix and them sort, select or play those elements in any

"As we set out to identify the majority of information

that potential users would need, we wanted to do so without locking ourselves into a single method of access or limiting our ability to dis-play that data; "be says. But nonstandard, frag-mented, redundant systems shat soibiled up much-needed edundant sy ed up much-o

across the region. "We would supply User A with one million records on one time share system that would mee work group's needs," mon says. "User B, hor Harmon says. "User B, however, can't use that particular view of the data, so be would have his own little data base on the same or possibly an entirely different time-share system

All of this data was pla at the end users' disposal, yet none of it was recognized as the official corporate data the official corporate data base. This view is changing, however, and Bell Atlantic's Marketing Integrated Data Analysis System is becoming the sole source of marketing information for the corpora

End users can now access the more than 1,200 data ele-ments found in the common data base, encompassing all of the typical applications and ad hoc queries as well as Must Software International's No-mad2, interface software

KEN SLOAN

What should every company demand from a computer system?



When your business is small, you can buy an IBM® Application System/400," and It will be just the right size. Later on, you'll still be smiling.

That's because as your company grows, your Application System/400 can grow right along with you. And the investments you made at first—in software, training and peripherals—will keep right on working.

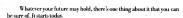
That's what the IBM Application System/400 is all about. It's based on IBM's leadership with over a quarter million mid-size systems already in place, and it does what growing companies have told us they want.

It lets you grow into what you need, without outgrowing what you've paid for.

Introducing the IBM Applica



tion System/400.



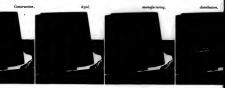
So, first things first, your computer system has to solve today's problems, and that's something you can count on from the new IBM Application System/400. Never before has a mid-size computer been introduced with so much proven software ready to go.

software ready to go.
You see, the Application System/400 may be new, but we didn't start from scratch. We built on experience.

Thousands of programs—for retail, manufacturing, accounting, construction, health care, distribution, office work and more—that run on the IBM System/36 and /38 can run on the Application System/400.

Also, they'll keep on running no matter how

The IBM Application System/400. No matter what business you're in, you're in business.



Today: Solutions from the leader in

big your system gets. All models of the Application System/400 share one architecture, and one operating system. So even if you're just starting out, you can make software decisions that won't fence you in later.

And you'll make those decisions with expert help. The people who support the IBM Application System/400 are specialists, not just in their field, but in yours. They can build a solution that's tailored for your kind of business, and your kind

of company.

What you're looking for, after all, isn't just a computer. It's the work a computer can do for you. So that's where the IBM Application System/400 began. Not with circuitboards, but with solutions.

for your business, business solutions. When you choose your IBM Application System/400 today, you won't have to guess how big it should be for tomorrow.

Because as you grow, it can grow. As you change, you can change it. The decisions you make today will make sense tomorrow, especially since your investments in software, training and equipment will be safe. Here's why.

The IBM Application System/400 comes in six basic sizes: Models B10, B20,



So let's say you have a Model B30, and two dozen yery good people. Suddenly your business takes off. You have scores of people. And you say to yourself, "Gee, I should have bought a Model B40."

Well, in many ways, you did. You can turn your Model B30 into a Model B40 simply by building on what you already have.

Honever big your IBM Application System/100 may greather some software will always work



# Tomorrow: Pro investment as your

From the Model B30 on up, the Application System/400 comes rackmounted, like a stereo system. Components slide in and out. So you can upgrade right on the spot. You're not locked into any particular setup. Your system's only as big as you need, and making it bigger is easy.

What's more, since the architecture never changes, your software goes right on working.

Which means your business does, too.
Also, the Application System/400 has a tutorial
system that's second to none. New users can practically
teach themselves, and tougher questions go on-line for
help from experts.

k-mounting allows for mounting allows for more more more proper prouch seithout ajor surgery.

But your toughest question, "What about the future?" is at least partly answered already. As your business grows, your IBM Application System/400 will be able to grow with you. And your investment will pay dividends.



tection for your business grows.



A good person to see about the IBM Application System/400 is an IBM Marketing Representative. Or, you can go to an IBM Business Partner, who's a partner of both yours and ours. Either way, you'll get a solution—software, hardware, everything—that's just right for your business, plus solid support down the road.

You'll also find support within. Every Application System/400 comes with two kinds of help built in. One's a teacher, the other's a lifeguard.

The teacher is a new kind of on-line education system. Actually it's more like a private tutor. People can start or stop their sessions as they need, so they can learn and do real work at the same time.

The lifeguard gives you timely customer support by connecting you with experts at IBM, or at your IBM Business Partner. Questions can be answered and problems can be corrected, often by remote control.

There's even a new way to pay for your system. Through the IBM Credit Corporation, you can lease everything with one monthly payment.

The IBM Application System/400 comes with more support, more ways, than any of its competitors, and it's support you can always count on.

Because, small or big, you're part of The Bigger Picture at IBM.

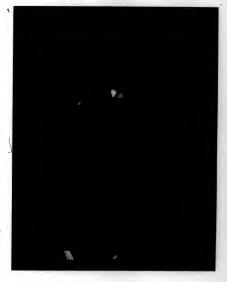
For a free brochure, or to arrange for a detailed discussion about the IBM

Application System/400, call 1-800-IBM-2468, ext. 81.

IBM. The Bigger Picture

#### SPOTLIGHT

# DISASTER PREVENTION AND RECOVERY



Destruction of systems and loss of data are not pleasant, but the only surefire protection against catastrophic damage is realistic planning. STRATUS INTRODUCES SQL/2000."

# Suddenly, the rules have changed for OLTP



Stratus and SYBASE, \* two masters of on-line transaction processing, worked hand-in-hand to develop SQL 2000 for the Stratus XA \* 2000 architecture. Result: The first distributed RDBMS that surmounts the demands of OLTP and meshes with work stations of your choice.

CHANGE THE RULES OF YOUR
DATABASE ON-LINE. ACROSS
YOURNETWORK While many

RUBBMSs let you make on-line
changes at the data level, SQL 2000 takes
you deeper. You can change the rules that
dictate how your business is carried outand effect that change across your network
without a ripple in the workflow.
That's because the rules that run
your business is carried outand without a ripple in the workflow.
That's because the rules that run
your business are afforced.

MODEL 50

centrally in the database. You make changes in one location for your entire network. And you never touch your application code.

PROCESS AT OLTP SPEED.

PROCESS AT OLTP SPEED.
Designed specially for OLTP, SQL/
2000 is the fastest around. It was
built on the requester's erver
model, uniquely suiting it to Stratus' multiprocessor architecture. You simply add
requesters and servers as your business.
And since SQL/2000 is built into the Stratus
Virtual Operating System (VOS?), the datasace foundation comes with every system.

PRESERVE YOUR STRATUS
INVESTMENT. You might have
expected SQL 2000 to Offer full data
integrity. Distributed processing.
MODELS 10 thrus 160

Easy, modular growth. But maybe you didn't expect that your current Stratus files are easily integrated into SQL 2000 without any conversions. That's because SQL/2000 and VOS share the same query language and interface, making SQL/2000 the most productive environment for programmers.

NTEGRATE WORKSTATIONS
OF YOUR CHOICE. Compatible
with SYBASE, SQL 2000 lets you
anged workstations. Utilizing Jours and
other UNIX-based workstations, IBM PCs,
PS/2s, and soon Macintoshess as intelligent
workstations, SQL 2000 brings OLTP to the
local level on the workstation of your choice.

5 PLUG INTO AN UNRIVALED SERVICE NETWORK Every Stratus user is united with the most sophisticated and successful on-line 24-hour remote service network in the industry.

the industry.

For more information on doing business by your own rules, call your local Stratus representative or phone (617) 460-2192.

**Stratus** 

The XA2000 family of on-line transaction processing syste

The OLTP Database Solution

#### INSIDE

#### Second Home

How to make sure that the hot site you select is a good fit. Page S5.

Fighting File Flu

in the way systems are managed. Page S8. In the Right Hands When used properly, PC-based disaster planning tools are useful, Page S9.

Toeing the Line

Contingency planning, al-ready required in banking, may be mandatory in oth-er industries. Page S10.

Top-Level Security Electronic vaulting prom-ises real-time data backup, but only the most critical applications can justify the cost. Page S11.

Hazy Future Proposed controls on ha-lon production cloud the chemical's future. Page \$11

Double Entendre The term "fault toler-ance" is being stretched to appeal to users who see protection from system failure. Page S12.

Ask the Vendor Vendors answer ques tions about electronic

Product Chart A detailed guide to hot sites. Page S14.

MacKeil

Designer/Cover: P. Charles Ladouceur

Protecting systems is a harder job these days. Threats are multiplying, and the level of acceptable downtime is dropping

## NO SUCH THING AS SMALL MISHAP

BY PETER SCISCO



fire in Chicago severely damages a switching office at Illinois Bell. Businesses are left without data and voice communica-tions, two vital links to their continued survival. Another fire, this time in a Los Angeles skyscraper, burns a number of floors and destroys the cabling that feeds several business data centers. A transformer explodes in downtown San Francisco, spraying a data center building with polychlorinated biphenals, or PCBs, and rendering it temporarily uninhabitable. The mainframe inside works fine and the data is uncorrupted — but the operators. George Derry, senior systems programmer at

and the data is tuncerupted — but the operators cannot get to it.

Less dramatic but also as disruptive, computer viruses infect system files and wreak have as they replicate throughout mainframe data bases. Traumatic hardware failures wipe out weeks of

Manuface must be reconstructed.

From earthquake to disk crash, the disruption of computer services can fatally damage any firm

of computer services can fatally damage any firm that is not prepared.

As on-line systems profiferate, decentralisa-tion grows and telecommunications become integral part of information processing, the defi-nition of disaster is also evolving. What does not change in the need for sound emergency plan-change in the need for sound emergency plan-

bility to process information," be explains. What ever might contribute to that loss needs to be as

He. I he maintrame inside works line George Derry, senior systems programmer at the East Bay Municipal Utility District (EBMUD) in Oakland. Callf., says his company is moving away from batch runs and toward interactive on-line systems. That means his window for recover-ing from a disaster keeps getting smaller and

senaner. "Our customer billing system is going virtually 100% on-line, except for meter reading," Dery says. "All of our accounting stuff is on there. Payvoil in on-line. We could probably get by for a few days — but that would be it. Then they would have to run a ritple or quadruple billing cycle in one shot just to get the bills out and process the newments."

payments."

Tom Consens, senior systems manager at the Space Telescope Science Institute in Baltimore, says there are different classes of disasters; ranging from earthquakes, fires and floods to power outages, disk crashes and intruding backers. He says he thinks the deficition of disaster has grown

to accommon ruptions.
"More and more, we're concerned about di-saster proceding against people coming in and desing things to our system, either accidentally or maliciously." Comeau says.
The definition of disaster is changing not only the service of disasters in changing not only the service of disasters.

#### No such thing FROM PRECEDING PACE

ery planning" is giving way contingency planning." Bus-ses must plan to survive and rate, no matter what the con-

resultant at AT&T's Data Se-ity Service Division, based in lando, Fla., says dependency bility of data is para

to a firm's survival. he pois recovral disasters are only the m



aster recovery implies to most people that there has been a disaster, which is fire, flood, earthquake, that sort of thing," she says. "Contingency planning is for business continuity." Busi-nesses provide the services, she rs, and the data center's pur-se is to enable firms to provide

"We're not necessarily talk-ing about the devastation of a computer center," Weyhausen says. "It could be the loss of nications lines, a loss of a ssor, or — what's big now es — the loss of the quality of your software so that it a no longer dependable."
Others agree. "It's very unlikely that this building will get hit by a tornado," Comeau says. "It's also fairly unlikely that it will catch fire. But it is fairly like-

ly that, even as we speak, there's a hacker trying to get into my system. In fact, I'd say it's almost a certainty."
"We used to think of [disas-ter] typically in terms of fire, floods, hurricane and tornado." says Hugh Smallwood, president of Data Base Recovery Services in Columbia, Md. "But it's startone part of a busiing to be things that are nonhis

To further complicate mat ters, the move-ment toward de-centralised data ocessing centers preparing emergency

gencies difficult More sites bave to safeguarded. nel have to brought into the on-making DEDOMS says. "It's not addressed by say-ing, 'We have a hot site for the data center.' That really doesn't The data center has tradition ily been the hub of the comput-

es along the rim. The rise of departmental mputing makes distinguishing to from spoke and rim difficult: Information is increasingly tran ent and active and less passive

and stable.
"More and more resp ity is moving out into the func-tional areas," says Gerald Isaacson, an indepen at Information dent consu vices, located in Northboro Mass. "That is a problem that

has to be addressed." Isaacson says every omizes that if the n goes down, it adversely affects

the company's abil to funct recognition leads people to think of disaster planning as a DP contingency plan, he says. They thinking of it as just

continuity plan - a plan that ses no the central data center but all of the departmental systems

Raymond Epich, vice-presi-dent at The Diebold Group, Inc. in New York, says be agrees with Isaacson. His firm asks businesses to step back and examine all aspects of their or when they consider a di They consider a disaster They have to be able to over from a disaster of any type at all of the locations," be

er operations wheel, with spokes nating toward secondary The Diebold Group estimates that only about 50% of central DP sites have an adequate disas-ter recovery plan. Epich says that roughly 5% of distributed processing centers have mad ntingency plans.

Decentralization does not in itself offer complete protection in case of disaster, but depart-mental sites can offer alterna-

tives when planning for it. Weyhausen says. use its remote facilities for alter-nate processing in cases in which the central data center is down. But to do that, a firm must first identify what its critical func tions are and then retain so processing capacity at the re-mote site — meaning an extra expense of maintaining hard-

ware that is not used. "Decentralization has the potential of offering some alterna-tives, but you have to design that right from the beginning," Wey-

en says. "If you try to retrofit, you might not gain any-

Myers, president of K. N. Myers & Ases in Pitte urgh, says that building a struc-ture in which minicomputers can opof out the ma s two things plishes two to First, it en

centers

ng the d covery period by cond, if they can not operate, the company can re sce them less expensively as are quickly than it can a mail vely an frame unit. By conserving re ces in this way, b can survive longer during di

Small savings Several alterna-tives exist for diverting small disas-ters like disk crashes and virus-es. Users can monfor potential prob lems, recover data lost in power out-ages or through human error and

are intent on infiltrating the sys-Space Telescope Science Institute's Comeau says he uses Digital Equipment Corp.'s Vaxsim to keep an eye on 12 VAX systems, which operate along with seven Microvax IIs, tw Vaxstation IIs and 13 Sun Micro

systems, Inc. work Vaxaim runs out of its own batch queue, he says, and moni-tors the error log. If the number of errors from a particular part of the system — a disk drive, for inthe system — a data curve, for in-stance — suggests a trend, Vax-aim notifies users with a light. Users can then run the product interactively to determine ex-actly where the problem is. A call

to the customer support center can verify the error-log anal

and replace the malfunctioning equipment before the problem

So far, Comeau says, Vaxsi has spotted two faulty head disk assemblies and one bad micro-module. The product's Autocopy feature shade ws the data on sus pect drives, he says, providing an automatic backup if it fails before can be replaced. EBMUD's Derry says be use

EBMUD's Derry says be usen the DRS Recovery System from Integrity Solutions, Inc. in Lis-tleton, Colo., to recover data lost to malfunction or error. The public utility runs a large cus-tomer service system, including tch billing run.

a batch billing run.
"We had a problem with our nighttime customer billing batch run," Derry says. "One of the programmers goofed and man-aged to clobber our customer billing master. This was a Thursday night. We had to recover four days of CICS journal entries." He says he was a bloom to the control of the

'He says he was able to re-cover a full day's entries in about 10 Aben ante, section manager in the custom-er information

er information system at Consoli-dated Edison Com-pany of New York, toring package from On-Line Soft-Inc. He says in 20% to 25% of the cases in which he has used Stabilize, the product was able to

repair damage caused by system outages and allow the system to keep functioning. le drawbock to syn One possib tem monitoring packages is that in some cases, they actually prong downtime, Abenante says. lize's surveillance region, which monitors the system, takes control when an error is detected and then moves to re-

If, for some reason, it can rform the repair, be says, the amount of time the product takes to complete the analysis and announce that the system has to come down might increase the outage time because

#### DISASTER CRITICAL DATA IDENTIFIER

DataGuard Incorporated, a firm engaged solely in the field of information asset protection, has developed a comprehensive software tool to assist you in the identification, backup, and offsite verification of all critical data sets to insure proper applications processing capabilities during a er recovery effort.

This utility software operates under MVS, MVS/XA, supports IDMS and IMS installations, provides the capability to rapidly, frequently and accurately review critical data sets usage, backups, and offsite availability. Written in SAS", this automated system is

lable on a license basis from:



4111 East Royalton Road Broadview Heights, Ohio 44147 1-800-433-0339 1-216-526-6373 in Ohio

ark of SAS treatment the

#### The EL CAMINO DISASTER RECOVERY PROGRAM Silverlake Hotsite / System 38 Hotsite **Emergency Hardware** Under \$5000 annually Replacement Delivery within Auditor Approved 5 working days Cali Michael Nemiroff

800-821-0229 EL CAMINO

delay in bringing the system down complicates the problem. That might explain why Abenante sees the role of recovery and monitoring products differently than some of his peers. "I don't consider the product halfs for disease recovers." The

says.

Con Edison's disaster recovery planning focuses on the possibility of an entire system failure or on the event that a data center, for whatever reason,

A S A PUBLIC utility, we're always concerned with (sabotage). There's always a possibility that sabotage can, in fact, happen."

FRANK ABENANTE CON EDISON

For those scenarios, the company has a multilevel contingency plan. On-Line's Stabiase serves only as a quicker way of reinstating the system and preventing an outage, Abenante

Keep on your toes
The key to preventing disast
caused by unauthorized intr
sions — either from hackers
siruses — is to be prepared a

it is also a good idea to maintain a sound level of security on the system and the networks it

Comeau says he tries to educate users to watch for encroachment. The Space Telescope Science Institute is especially vulnerable to hackers and viruses because it must re-

"Preventing an intrusion is almost impossible in a syster like ours because it's an ope system," he says. \"We have t he available to the world at large "We thought we had one [v

er one and barely avoided having one of our users run it."

He says that the time lost in racing a backer and repairing

the sabotage.

The Space Telescope Scienc Institute takes a number of secrity measures to guard agains

Personnel are constantly monitoring the electronic bullstin and talking with outside developer contacts at vendors such as DEC and Apple Computer, 
lac. to find out what the latest bugs and viruses are. The status of the software is also constantly monitored in order to detect changes in how the software is

Finally, Comeau says, personnel carefully inspect all shareware that they copy onto their network. "We don't install anything we don't have source [code] for, and we look at the source really carefully," he ex-

[code] for, and we look at the source really carefully," he explains.

"As a public utility, we're always concerned with [asbotage]," Con Edison's Abenante says. "There's always a possibisays." There's always a possibi-

ity that sabotage can, in fact, happen."

' Con Edison uses a variety of software security packages to

Con Edison uses a variety of lottware security packages to safeguard its applications and maintains a watch over who enters the site by using badge readers and magnetic strip identification cards. "Those things are really targeted toward the deliberate types of [disaster] causes," Abensate says. Whether disaster comes at the hands of a hacker or at the whim of nature, the first line of defense is a plan of action.

Not so easy

At central data sites with clear
lines of command, the responsibility for planning usually falls to
the DP department. But at remote sites, shouldering that responsibility is not always so clear

and simple.
Part of the problem is that re

Part of the problem is that remote sites are just that — remote. Separate from the corporate mainstream, departmental business units are cut off from the collective corporate memory that can assist in designing a sound diseaster plan.

"A lot of the sites and armeri-

Would you spend a few thousand dollars to save millions?

They did.

How much is a corporation's data worth? Some say millions. Some say it's priceless. Some don't know until they lose it.

The DATA RECOVERY SYSTEM (DRS) from Integrity Solutions in the world's leading VSAM integrity systems for IBM maintrams curvatures. With it, both CICS and batch VSAM data can be quickly and easily recovered in the event of inabevient data correption or loss. Redundant batch backups can be diministed, And CICS journals and logs are automatically archived with the DUPANL JANG-CHENTY SYSTEM (JMS). One URAN JANG-CHENTY SYSTEM (JMS).

The DATA RECOVERY SYSTEM from Integrity Solutions Because your data is worth it.



Integrity Solutions, Inc. 7921 SouthPark Plana, Suite 200 Littleton, CO 80120 1-800-289-9900 or (303) 794-5505 "You have to plan for the ab-solute worst case," Data Base Recovery's Smallwood says. "You have to plan for absolute

PERCENT OF ENGINEERS

total destruction to affect all ar-

"It's no harder to plan for the

The Diebold Group's Epich

orst than for something triv-

says. "In the old days, people used to sit around and agonize over what could happen. And they would say, "What are the

odds of a fire? Oh, it's one in a

1,000. What are the odds of an earthquake? That's one in a mil-

e business if that is the

case? That's a much more creative way of approaching it.

That means determining the

impact of being down for one day

how that impact will affect reve nue, customer base and local

business. It becomes a mathe-

matical evaluation of risk vs.

study, Weyhausen says, firms must identify what kind of inven-tory of data and communications

When conducting a criticality

The first step in bu tinuity planning is to define how

vs. five days vs. 15 days. wood explains, and then figuring

critical the computer syst

Don't mess with Mother Nature

Earthquakes and water were the damaging factors in al of 91 documented disasters, other causes included humi software error and struses, sewage and toxic procuation

st not transmitted out to an inidual business unit manager who may have a mini or a micro on his own premises," The Die-bold Group's Epich says.

"He really doesn't remember when they were down or out, when they had backup and recovery problems or when the data was destroyed. They just don't know about things like that," Epich continues.

He says some companies are riting contingency plan policies d then teaching the decentraled sites what the potential

says that in mainframe remains functional but a departmental system fails, disrupting the whole company. The business may remain. tion, be says, but it must ree the impact of that depart-

If the department supplies a itical function, then a disaster in must be implemented for it. ibure to understand the criti-lity of remote sites increases the risk to the bottom line, be

OU HAVE TO plan for the absolute worst case. You have to plan for absolute total destruction to affect all areas."

> HUGH SMALLWOOD DATA BASE RECOVERY SERVICES

"The risk is increasing not because of decentralization per se but the fact that people particularly with microcomput-particularly with microcomput-ers — have a hard job under-standing that when you get a mi-cro on your desk, you become a data processing center," Isaac-

son says.

With that understanding comes responsibility — for data backup, for planning and for be-coming aware of security con-cerns. "People have been trained to think DP will handle all of that."

of that," he says. If a business unit is to op unfettered — streamlined and on-line — it cannot do this with

one foot in the corporate DP center. The unit has to he able to stand alone and survive should ster strike

Decentralization also brings up the subject of communications, perhaps the newest area of contingency planning to be ad-dressed. Remote as they are, decentralized sites have access to

In many cases, a business success depends on that link. This is an area that was thrown into high relief by the recent fire in Chicago that roared through a main switching office at Illinois

saster that people had not thought of," Epich says. Although many firms might have dual feeds from electric utilities, phone lines are overlooked, he neve redundant phone service are one in 100."

Companies also have to look their local-area petworks "The functionality that allows us to develop these decentralized and distributed processing envi-ronments is the network itself," Issacon says. "When that goes, rything stops

For disaster planning, the fo-cus is on data communications - not by common carrier but by cable in the buildthe LAN, he says. Companies should incorp

rate a contingen ion.' And they'd think the cy plan for the network at the all these odds and think about the time the network "We encourage people not to fool with that anymore. That's designed and through not the issue," be continues. "The issue is, 'Let's assume that with that plan when it is im there is a disaster and we cannot get into that room.' How do you

"Not only are you looking nowadays at being able to re-store the computer," AT&T's Weyhausen points out, "but you have to be certain that you have a complete inventory of all your communications lines, that you determine some alternate routing if necessary and that you provide for that in your contingency

Companies need to know not just their hardware vendor, she says, but their communications ndor as well

Top priority But whether it is for a small decentralized site, a larger depart-mental site or a main DP site,

ng is the key to surviving a saster. And when planning for

they need to supply those func-tions deemed critical. They must also determine how long they can go without those function and remain viable

Plan for survival ased on the answers to its criticality analysis, a company has several alternatives for disaster recovery planning. For the sur-vival of the data center, they include the following: Off-site tape storage. Sensitive data, including operating systems and data bases, is

nates the transportation costs and time lost in shipping media by truck. Backups of the compa-ny's files are transmitted by net-works to a storage facility. where they are downloaded In case of an emergency

Electronic vaulting. A form of off-site storage that elimi-

to a storage facility for safekeepbackup can be sent immediate again by network, to the com Consultants and most user see this as only one step in disas ny's designated disaster recov-

ery site.
• Cold site. A shell, co ter recovery planning. Off-site storage is inexpensive, but it storage is inexpensive, but it cannot help if the firm has no acwith wiring, raised flooring and air-conditioning, that the firm

can use as a temporary data cen-ter. Arrangements must be made with the firm's hardware vendor for the replaces

• Warm site. An offshoot of the cold site, this shell facility incitades communications lines.

• Hot site. A complete data cen ter into which the firm can move with its systems and continue operations until its own data center is rebuilt or until it gets the replacement hardware so that it can move to a cold site. Firms should be prepared to pay dearly for a bot site. • Redundant data center. For

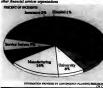
ies too large to fit into hot sites and with pockets deep enough to invest in a second data er, this is the ultir ter recovery alternative The expense is the big draw-ack here; it takes resolve —

and money — to maintain a system for backup rather than for No matter what alternative a

cess to its mainfram Reciprocal agreements. An agreement is made with another data-center, sometimes within the same company, to process the company's information ei-ther by sharing time or space on the system. By most accounts,

23%

No safe harbor Inoncial industry was hardest at one-third of 91 incidents sta financial services organization



ese agreements simply cannot ork well enough to avert disas-

company chooses, and no matter if it is for the central DP center or a distributed processin ter, Epich says a basic d Service bureaus. An arrangement is made for an outrecovery plan should include two le vendor to process the com One, the firm should pany's information in case of a

response team. It should designate people in advance and as-The drawback here is that most service bureaus are not de-signed for that kind of function, and they already have nondisassign responsibilities in case of di-These can range from orde ter-related customers to ser

ing new hardware to resurrect-ing the off-site data to notifying families in case of injuries. Two, the company needs to know where it can access the things it cannot get its hands on after the disaster happens. That includes data, forms, equipment, where lines and companion over

phone lines and computing pow-er. "There's all sorts of things you have to plan and do, and only

McWains Chelsea. Inc. (201) 993-5700

## Approach your hot site as home away from home

Hot sites are cropping up all over. This variety means a wider choice and some leeway when the time comes for an organization to negotiate a hot site agree-ment. Users, vendors and consultants have suggested the following factors to keep in mind when making a choice.

monthly fee, a one-time declaration charge when a firm declares a disaster and wes into the hot site and a daily fee once the company is up and running at the site. Frequently, however, some of these costs are negotiable.

For example, Sysgen Recovery Ser-rices, Inc. in Wankankamo, N.Y., waived the disaster declaration fee for Columbia

Furthermore, what cannot be negoti-ed may be covered in other ways. Den-Spices, associate executive director of

as Spices, associate executive director of the State Universities Retirement Sys-em of Illinois in Champaign, says that unsiness interruption insurance can cover orth disaster declaration and daily run-ing costs, which would leave the monthly se as the only nonreimbrand

e as the only nonreimbursed cost.

Wayne Edge, president of the Hotsite vision of Compusource in Cary, N.C., ye users should also ask whether a ven-

says users should also ask whether a ven-dor offers graduated cost options.

If, for example, a firm agrees to be bumped from the hot site to allow another firm in, it should expect to pay less. Con-versely, if a firm wants the right to move other systems out of the hot site because of the critical nature of its busi mpany can expect to pay a premium. asolidated Edison Company of New York, Inc., for example, pays a premium to ensure sole access to its hot site in the

Compatibility. In its most obvious ense, compatibility means choosing a ite that caters to the hardware brand a firm uses. A growing number of firms are offering bot sites for non-IBM hardware. The term also means that the hot site up-

The term also means that the hot site up-rades and maintains its hardware to re-tect technology developments. In addition, compatibility refers to hoosing facilities that are a realistic antibility of the company's systems needs. In addition per second (MIPS) of equip-sent A rule of thumb, Edge says, is to look for a site that can provide 60% of re-dart a firm runs on at home — for examhat a firm runs on at home — for exam-e, a 10-MIPS shop could back itself up

e, a 10-MIPS snop could back itself up the 6 MIPS of equipment. Location. Transporting personnel ver a long distance can add greatly to the st of coping with a disaster, so it is preferable in most cases to chose a hot site that is close to a firm's operations. Bees savings in transport costs, having a nearby can mean faster setup, rter hot site time and employees who

It may also be a good idea to look for

itment. Check the site provid-

ning equipment, coupled with lon es cycles, means there is a high probi ty that some vendors now in the mar ket will not remain there and that new ones may not succeed. According to Compusource's Hotsite division, 23 compusource's Hotsite division, 23 compusies have left the business since 1978.

Telecommunications flexibility
This is an often-forgotten consideration
the importance of which is underscore

by the May fire at Illinois Bell. Firms should examine the hot site's access to rks, its drops to the nearest central switching office, the modems and multi-plexers available to hook into, overall nications policies and contingency regional disasters.

Every bit counts
Organizations should also keep in mind
that the data center may not be the only
facility that will need to be relocated and stems-related elements are not rily all that should be considered

when evaluating bot site options.

Raymond Epich, vice-president of The Diebold Group, Inc., a N.Y.-based conducting firm, advises users to consider the availability of hotel space, office space and

all of the normal office products - down to paper clips - when planning for an al-

The U.S. Postal Service can verify the sdom of that advice. After a fire shut down all computer operations at its Washington, D.C., headquarters in October 1984-the Postal Service had to move not ly all its applications but also a total of

"Getting our system back up was one of our smaller tasks," says Rita Crawford, acting manager of DP security at the Postal Service. What was worse, she says. was dealing with the inconveniences caused by unforescen shortages. Staffers had to double and triple up on telephones and stand in line for two restrooms.





When any of tueste tal. It can tree pursuption of the property of the property can be publicable.

The expecters at the fibround selection for the the systems on electrical
power that has been illitered by the POWER SFTOR! From Current
Fedendogs.

The company of the property of the p

The Power to Succeed





an • Richardson, TX 75081 (214) 238-5300

Power Siftor and The Power To Succeed are registered trademarks of Current Technology. Inc

#### No such thing

FROM PAGE S4 out 5% are related to having a drup site for the computer," ich says.

pich says.

He adds that choosing as, airmate processing method could come far down on the list, sly after a lot of study and analiss. "It's sort of the last step,"

he says.

Off-site, tape storage is the Ford Falcon of disaster recovery. It's cheap enough for everybody, and it's been around for a long time. EBMUD uses off-site storage as its only sure alterna

"We have a 4381 and a 4341, but they're both in the same room on the same floor," Derry says. "If we had a major fire in

there, we'd he up a creek unless we could find somebody that could give us a place to run."

Money problem Although EBMUD would like to

Although EBMUD would like to have a hot site arrangement, Derry says the cost is prohibi-tive. "Being a public utility, you really have to show major justifi-cation," he says. "You've got to nois in Ch build a real strong case to put it

at the board of directors, who

past the board of directors, who have a hard time understanding 90% of what we request from them anyhow because they're totally non-DP-oriented.\* By most accounts, reciprocal agreements simply do not work. Dennis Spices, associate execu-tive director of the State Univer-sities Retirement System of Illi-nois in Chamosien, savs his

rocal arrangement.
When Spices put that agreement to a test, the reciprocating partner said his operator had to come in at 4 a.m. on Saturday and he out by 8 a.m. Monday. "We felt we might he liable if we couldn't get the system back to

couldn't get the system outs, we them," he says.
Wayne Edge, president of Hotsite, a division of Compu-source, calls reciprocal agree-ments "one disaster waiting to impose itself on another disas-Champaign, says his on gave up on its recip-

> ECIPROCAL agreements are "one disaster waiting to impose itself on another disaster."

WAYNE EDGE COMPUSOURCE

If a firm wants to use a recip rocal agreement as its disaster recovery alternative, he sug-

recovery alternative, he sug-gets that the agreement be drafted by company attorneys, and signed by company officers. Service bureaus do not far-rungements. "Service bureaus are really geneal toward produ-tion," the University of Hart-rof's Dillman says. "Their mis-sion in life its to provide data processing for any number of soon in size is to provise care
processing for any number of
companies. To use a service bareau [as a disaster recovery
plan], a lot of innocent companies
would get kicked off the air."

EBM/UD's Derry looked into

problems with remote require-ments because the bureaus did not have the support for the communications the utility need-

Although he could work around that lack of support, Der-ry says he is not too confident in the service bureau'a ability to stand up to a real disaster. "It's all spit, chewing gum and buli-wire," he says.

The lettest trend
Electronic vaulting is the new
lad on the disaster recovery
block. The speed at which backup data can be retrieved and the
savings in transportation costs make vaulting an attractive al-ternative in the off-size storage arens. But it's still only storage — just data waiting for a place to

Shell facilities come in three Shelf facilities come in three temperatures —cold, warm and hot. According to Dillman, the school maintains a "warm" afte on its campus, consisting of 4,000 square feet in the operations and maintenance building. It is equipped with air-conditioning and communications inits to the school's on-time systems. If the university's main data center with its IBM 4381 were to become inoperative, Dillman



tely wired and on-line, in ce or four days.

An alternative within the shell arena are rolling cold sites, such as those offered by Provi-lent Recovery Systems. Mobile such as those offered by Provi-lent Recovery Systems. Mobile lata center modules — com-plete with cabling, generators, tir-conditioning and raised floor-ing — can take the place of a

ng — can take the place of a tricken data center in case of a laster. Arrangements for re-lacement hardware can be sade through Provident or han-led by the client company.

If tape backup is the Falcon, hen hot sites are the Cadillacs of ter recovery — not every-can afford one, not every-needs one and not every-

want for companies such as a and hospitals that have to tain service no imatter hot sites are the only vis-

me to weit

Taylor, director of data
uning at Columbia Regional
tal in Columbia, Mo., says

with hot site vendor Sysgen Re-covery Services, Inc. in Wankan-kamo, N.Y. The ability to get up and running quickly was a major 'In a hospital, you're running 24 hours a day, seven days a week, 365 days a year. You don't have a whole lot of time to wait around," also important was the fact that the Syagen hot side was compatible with the hoogital's Data General Corp. MY/10000.

Data General corp. mv/avovo.

"Data General in a big manufac-turer, but it's not Big Blue.

There's not a whole lot of people out there who have this kind of recovery for a Data General,"

Taylor says she expects hot site vendors to increase their machine mix to match the needs of distributed DP centers and to market to non-IBM shops.

market to non-HSM shops.
For instance, Weyerhauser
Information Systems supports
IBM, Hewiett-Packard Co., DEC
and Honeywell Ball, Inc. hardware at its hot site in Washington state. Edge says Compusource is "actively pursuing
hardware other than IBM."

If hot sites are expensive, the cost of maintaining a separate data center is excessively so; nonetheless, it does make sense Bill Eldridge, technical man-ager at Travelers Insurance Co., says the firm's Hartford, Conn.,

data center is matched by one in Norcross, Ga. The firm has sev-eral IBM 3090s and 3084s at

In case of disaster, the com-sny has decided on a priority of oplications that it will run at ichever site is active.

Norcross site was chosen be-cause it was geographically sep-rate from the Hartford power grid, Edridge explains, nearly eliminating the possibility of a double diseaser.

POTL

ter to wind up spending \$150,000 to \$300,000 every year for to site support that will probably never be needed."

Users first
Myers says his approach is to focus on the users, not the DP
managers, and to devise a plan
that puts full responsibility for

USINESS CONTINUATION planning is a people problem, not a technical

> KENNETH MYERS K. N. MYERS & ASSOCIATES

Keeping a second data center free enough to operate as a back-up center takes resolve. It's a commitment from upper a business operations in users' hands, even if it means doing manually what the computer "The very same people whom you would think you'd cut

commitment from upper lever management and a processing center to survive in that busi-ness," AT&T's Weyhausen says. The need for it goes back to how critical the DP functions are their arms off if the system were down for 15 to 20 minutes . . . will find ways they can operate without the mainframe for peri-ods as long as 30 to 45 days," be It is that focus on the data center that bothers consultant Myers. "I think [the focus on the

ing is a people problem, not a schnical issue," be says. "Just ecause on a day-to-day basis data center] could be a milistone around an MIS director's neck," be says. "It's not unusual for a medium to large-scale data censing the computer for routine sks is easier for users, and to using data processing as a ser-vice organization, does not mean that data processing has the re-

vice organization, does not mean that data processing has the re-sponsibility for getting out pay-roll. They do not. "While some firms may be able to operate up to 45 days without the DP center, as Myers sug-gests, others do not enjoy that

luxury.

Banks, for instance, are required by law to have a tested.

verifiable recovery plan. They cannot close their doors for more than 36 hours or the government will shot them down. Dilman says be expects to see the same kind of regulations in the health, insurance and financial

it is a company's commitme endure flood and fire, ha ad hurricanes, shutdowns and aboteurs that will move it to ard disaster recovery planning. "What makes contingency

"What makes contingency planning really work is not that a regulator tells you to do it." consultant Issuescen says, "but that senior management understands how, as we get more dependent on technology — no matter what form it takes — the cost of maintaining the narvivability and the availability of that technology becomes not not be cost of ogy becomes part of the cost of doing business." •

## YOU CAN TELL.

You can tell by missed movein dates. Project overruns. Hot spots. Disk crashes. Power glitches. Bad work flow. Poor expandability. If you've used a non-specialist you could probably add more.

Don't be part of someone's money—and grie learning curve. Work with the specialist—CFS-DESCO. Our only business is computer facilities. We've planned, de-signed and built over 2700

arryone else. Call us today for your expan-

sion or new center. Find out how the technical experts at one of our nine regional offices can save you time, money-and grief





### No vaccine to ward off effects of virus attacks

BY BELDEN MENKUS

Computer viruses pose a new threat to the health of information systems. They have demonstrated the potential to dis-rupt computer activities as thoroughly as a fire, flood or tornado. Furthermore, vises appear, at present, to be far more ficult to protect against than any of one more familiar threats.

these more namear threats.

A computer virus is a code that infects other programs and causes them to do things they were not designed to do. These actions may be comparatively innocent, such as displaying a cartoon character or some form of graffiti, increasingby however, computer viruses have become malevolent, involving disorganisation or erasure of disk content directories or actual contents on the disk.

These germs of destruction.

These germs of destruction will most likely sweep through whole organiza-tions, disrupting the operation of large critical information systems. Further-

rille, N.J., is editor in chief of the monthly "ED-

more, while total paralysis of a company is not usually the intent, the focus of attacks seems to be shifting in that direction. As-saults on individual disk files are evolving into attempts to vandalize interconnected disk arrays supporting mainframes and ef-forts to interdict the operation of large

The types of systems that could be devastated by such an attack include those engaged in communications traffic switching, on-line medical condition monitoring. - which is no longer isolated in electronic document interchange, electronic funds transfer and what is current-ly being described as screen trading of

arious types of securities. Super version of Trojun horse Viruses are the latest refinement of a type of rogue program — known as a Trojan horse or a logic bomb — that has plagued data processing in a much more minor way for at least 20 years. While Trojan horses and logic bombs are typically created to damage and destroy, a couple of nces exist between these ider code-embedded infections and to-

To begin with, most detected Trojan horses and logic bombs have resulted from the activities of insiders; most viruses appear to be introduced from the out-side. Increased reliance on sustained on es appear to be introduced from the out-side. Increased reliance on sustained op-eration of large interconnected DP activities has exposed organizations and their critical systems to this sort of van-dalism by individuals not directly connect-

ed to the system under seige. Second, Trojan horses and logic borni Second, Trojan horses and logic bonnes seesentially uncontagious — they go off when the proper conditions have been fulfilled and then become inert. Viruses, on the other hand, have been designed to the virus copies itself to various readily accessible memory locations each time it

each successive virus copy can be acti-vated independently and repro-duce itself, thus board for reports of virus furthering sin of infection

attacks generated reports of Typically, vimore than 100 incidents in a few hours.

run-codetammarca programs are downloaded from. an electronic bulletin board. However, in at least one instance, the infected soft-ware garried on a disk in packingin gregu-larly used by the program's developer. There is no evidence that the developer of the infected software made a deliberate attempt to corrupt its products.

People who develop computer viruses appear to be concerned mainly with demonstrating their power to other comput ing professionals — they do not speed, a present, to be concerned about the dis-ruptive consequences of their actions.

In sheep's clothing
A computer vitus may operate on its own,
A computer vitus may operate on its own,
but most often, it is attached to some othor apparently innocest program. While onposter vituses seems to exist, the same virusch have appared selectively is various
parts of the world. In one instance, one
vituses seems of the vitus of the vitus of the
vitus in a vitus of the vitus of the vitus of the
vitus in a vitus of the vitus of the
vitus of the vitus of the vitus of the
vitus of the vitus of the
vitus of the vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of the
vitus of th

widely used programs.

Equally worrisome is that the struc-tures of virtues seem to be becoming more sophisticated. For instance, some have demonstrated an ability to respond to the user of the infected system with spurious — but apparently legitimate — messages before attacking. And the next seration of viruses is expected to be generation of variates in expectate and able to selectively modify program and

the current practice.

Virus filters – a class of programs designed to detect viruses before they can indice either date or programs. Indice either date or programs. Indice either date or programs, between only limited success in catching a virus before it can infect the main program. Most use some form of check-sum calculation, in which various factors are used to verify that the same information resides in the fife, to indicate when musturnized out any have been andded to a monthly of the contraction.

designers also assume that the virus will be of sufficient size to be readily identifi-able as an unauthorized modification. Unfortunately, some viruses have appeared at the end of a program, and it has been demonstrated that a workship virus can reduced to three lines of code.

on reduced to three lanes of code.

There is every reason to believe that
future generations of viruses will be hidden at the end, or even in the center, of a
program. It is also likely that some may be
distributed as code segments throughout
the program, to be assembled later when the program, to be assembled atter when a triggering event or time is reached. Vi-ruses have also been discovered masquer-ading as a bad disk sector while they awail activation. It is highly doubtful that the existence of an extra bad sector would be

REQUEST placed in

one metropolitan area electronic bulletin

readily recognized.

In addition, spurious versions of viru filters to which vi-ruses have been attached have also appeared.

> A cure? Computer viruses are a major se-curity threat. curity threat.
> And some time
> may elapse before that threat is

date appears to be far greater than indicated by reports in the general news me-dia and DP trade press. For instance, a request placed in one metropolitan area electronic bulletin board for reports of vi-

electronic bulletin board for reports of wirus attacks generated reports of more than 100 incidents in a few hours.

Various strategies for limiting virus infection have been proposed. For instance, one approach suggests that the absolute isolation of a virus in the Intel Corp. 80386 microchip environment is possible because a 386 machine can be partitioned into numerous virtual machines. This ca-pability supposedly keeps material from one part of the machine from moving into

other parts. Another suggested approach is to issue program code in a nosmodifiable
compact disk/read-only memory form compact disk/read-only memory form rather than on a conventional write-many erasable magnetic disk. Again, it does not appear that either of these protective ap-proaches can be realized on any broad basis before the early 1990s, since early re-actions have indicated that both user and

vendor acceptance will be slow. While the risk of infection cannot be eliminated yet, the following risk-reduc-ing actions seem prudent in the interim: Restrict downloading of files and soft-· Limit the use of software products -

including commercially developed pack-ages, "freeware" and "shareware" — that have not been independently verified nd other telecommunications ports that revent direct access from outside-to-

· Segment data center-resident directis space — to reduce the poss

mory.

Reducing the threat posed by the new saster vulnerability that computer vises represent will lead to other changes

Generally, filter designers assume that the virus code will be located at or near the front of the program. Thus, the check-sum calculation may be limited to perhaps the first 100 lines of code. These



WHEN A DISASTER STRIKES

- Wouldn't you rather stay on-site to recover, where your staff, com cations network, and operations are most
- easily accessible?

  Wouldn't you like to get out of "Disaster Mode" as quickly and sanely as possible?

  Wouldn't it be nice to cut recovery costs by as much as 75%?

ISN'T IT NICE TO FIND A RECOVERY SERVICE PROVIDING ALL THIS AND MORE?



Corporate Headquarters: 110 MacKenan Drive, Caty, NC 27511 (919) 481-0011

## PC packages will assist but not carry

BY TARI SCHREIDER

After surveying the carnage left by the re-cent rash of data center disasters, many MIS managers are server. MIS managers are anxious to acquire pre-vention planning and risk assessment aids that will help them size up and address

vulnerabilities.

Currently, 44 personal computer-based disaster recovery and risk-estimation software packages are on the market, with prices ranging from \$450 to more than \$35,000. While the oldest has been available for 15 years, most have come to arket in the last two years, and another we are scheduled to debut in the next six

12 months.

PC-based disaster planning develop-ent software is composed of a word proessing system, project manage

HE DEVELOPMENT of an effective plan should be thought of as a journey, not a destination.

software and a series of templates and forms. Most of these products are useful regions of the series of the serie

to two stilles to the stilles to the

en evalua When evaluating these packages, it is more important to establish the develop-er's expertise on disaster recovery than more important to establish the develop-or a expertise on dinaster recovery than the eigennee of his code. Pschages that are filter more than a series of checklists and the control of the code of the code of the plans. For the most part, however, prob-plans, For the most part, however, prob-pains code of the code of the code of the plans wing PC-based disaster recovery softwares have little to do with the pro-grams' quality and a lot to do with how and why the packages were purchased. Too often, organizations make their selections of the code of the code of the code of the first thinks of bells and white without fart thinks of bells and white without fart thinks the code of the code of the code purchased.

business.

As a result, many companies have picked a product in haste, only to discover that either the field for the department code was too small, the documentation was so poor that it made the product virtually unusuable or the product was no

ger supported. In addition, such software packages of

JULY 11, 1988

ten present users with large amounts of information without offering an analysis of that information or taking into account

Most packages also neglect an area acial to most organizations today — the reonal computer. But a new generation personal computer, but a new generation of reasonably priced software will address the end users and companies that do all their processing on PCs and local-area networks. These products are designed

rith expert shells and can be used i

Most vendors in this arena are small to medium-size companies that are usually willing to work on bettering their prod-ucts with their clients, a direction that cli-

In too many instances, disaster plan-ning packages are purchased only to pac-fy corporate auditors. This state of affairs has not escaped the attention of vendors. In fact, many aid and abet this dangerous

practice of using products to come up with a quick and easy plan that looks good on paper but is no help in preventing or limiting a real disaster. More than half of the PC-based software packages available offer "canned plans" for this purpose.

The need for effective disaster recov-

development of an effective plan should be thought of as a journey, not a destina on. It is a process that occurs thro

in the ratios of an experienced disaster recovery coordinator or security office PC-based software packages offer increased the time savings in developing a busine resumption plan.



SUNGARD

## Begin contingency planning, or you might become an outlaw

SANFORD SHERIZEN and ALBERT BELISLE

ate — telephone switching inter outages, widespread coding and high-rise fires — in-mation processing is highly pendent on conditions outside e control of many, if not most, trate — telephone switchi

The only way to regain a mea-re of control is for managers to the continuous vibraning a pri-

While this is a sound rationale actify the necessity of continocy planning, it is not suffi-nt to make companies decide act now. Most businesses con-

et will make contingency og an integral part of cor-strategic planning are rate strategic planning are vernment or court mandates, is kind of planning will be-me the norm when managers rt being evalunted on how their preparations meet cer-planning criteria. he model for such required

ment attention is cur-

m, president of Data Security as in Natick, Mass., consults on inas security and contingency Balinie, deputy director of corrently found within the banking community and will soon be im-posed on other industries. By un-derstanding what bank management has to do, managers in other industries can be prepared for what the future may hold for

Banks and the OCC The Office of the Comptroller of

The Office of the Comproder of the Currency (OCC), an agency of the U.S Department of the Treasury that regulates and examines the operations of national banks, has recognized contingency planning as an essential aspect of bank operations and planning. Accordingly, it has issued several banking circulars concerning mandatory persentence of autional banks to The OCC first issued a continence of lanning requirement of the operations and the operations of the o

gency planning requirement at 1983. While it was primarily ned at first with the reery of the data center and its ability to provide data processing services, the OCC has since expanded its definition to include

ntingency planning for key op ational areas of banks. More recently, these con-cerns have extended into contingency planning for microcom-

Contingency planning for in-formation systems under the OCC's guidelines requires man-agers to do the following:

DATAGUARD

Because So Much Of Your Business

DATAGUARD Toll Free 1-800-325-3977 In Ky. (502) 368-2501

Depends On Your Computer

Disaster planning is an essential element to any company that relies on computers. Could your company survive losing its computers for days, weeks, or months?

 Determine the critical func-tions of the bank.
 Define the objective of information technology in the corporate strategy.

• Define the bank's communica

· Determine the critical information system of the bank.

 Assess the risk and impact of loss of data, use of incorrect or untimely data or the loss of DP support on criti-cal functions.

Develop the means to reduce the impact or risk to a prudent

• Establish controls cessing.

Determine

nal structure for best organizations on information processing.

• Establish guidelines for coordination the acquisition of hardware and software. Coordinate distributed users.
 Under these regulations, a bank's management is held accountable for the soundness of

its contingency plan and its peri odic testing. An assessment of the plan's adequacy must be pro-vided annually to the bank's board of directors, which is reble for the review and apval of such an assessment.

ed in the board's minutes and verified at each OCC examina tion of the bank. While these res only to national banks, they have many implications for nonbank-ing manuary

ing management as well. Recent disasters affecting a spectrum of industries have pointed to the good business sense of develop-ing a thorough contingency plan. There are already an increas-ing number of laws defining ac-ceptable business practices. Le-

ceptable business practices. Le-gal attention will soon be paid to failure to survive a major busi-ness interruption, which will be considered a malfeasance of duty. This attention may serve to open a wave of lawsuits con-cerning implied service agree-ments within contracts.

To reduce the liability expo-

sure as well as mitigate the devastating results of a major business interruption, comp would do well to prepare a docu-mented and tested business in-

Step ogainst disester MIS managers can take a num-ber of steps to ensure that con-tingency planning is performed in a manner that adequately pro-

tects the business from exces-sive loss and shelters themselves from liability.

sive loss and shelters themselves from lishibity.

• Conduct a legal sudit. Undertake skell sudit d'computer systems to determine the ramifications of insidequate finisater control and recovery. Determine what is at state if immediate recovery in not possible. Examine who the law or regulations might hold responsible and whether contingency planning is whether contingency planning is aure to ask specific legal lishibit; aure to ask specific legal lishibit; mare to ask specific legal lishibit;

questions.

Set managerial roles. The manager in charge of contingency planning should primarily fo-

pects of d EGAL attention will soon be paid

to failure to survive a major business interruption, which will be considered a malfeasance of duty. This attention may open a wave of lawsuits concerning implied service agreements within contracts.

information crosses many de-partmental lines, this manager should have enough political power to bandle these bound-

Asach planning, this manager should point out to senior executives the OCC views of management responsibilities and how this mi serve as requirements for thei industry in the near future. Mar agers should realize that contin ncy planning is not just a tech

An organization should look at data processing as a way of achieving its business objectives,

and its contingency plan should reflect that. Adequate resources for contingency planning tend to be provided once managers real-ize the importance of disaster their personal as well as corpo-

 Extend controls. Determine how reliant your DP system is on the contingency plans of other companies providing telephone, electric power, flood control and electric power, flood control and other essential services. Ask these organizations questions about their contingency plans. What are they doing to prevent or minimize disastera? Also con-sider whether your organization must strengthen particular as-

ing specialized dis-tributed processing and redundant sys-

ing for survi money and re-sources. However,

the cost of being un-prepared can also be staggering. Managers must con-sider the possibility of not being able to recover data, the nega-tive public image that may arise resulting in loss of customers

tem, formal inquiries from st holders and governmental agencies or even ultimately not eing able to continue to func-

aroun oc cierr instituting test-ed contingency plans makes a leading-edge company. Having no plans makes a bleeding-edge company. Soon the choice will be

#### Looking for used equipment? Get used to finding what

you want - and saving time with MARKETPLACE.

#### COMPUTERWORLD MARKETPLACE

Shop for the produ



## If you can't afford to wait...

Experimental and costly, electronic vaulting isn't viable for everyone

#### BY TARISCHREIDER

fost companies do not have pro-odures capable of creating ab-olutely safe backup on a realstoutely safe backup on a real-time basis; the majority does not need that level of protection. There are, however, firms with critical applications that are worth up to \$20,000 a minute. For that Isind of site, the abili-

were up to knowled a measure. If you recover a the energy part of failure represents both a signifi-ty to recover at the energy part of the ener

A decade old

The basic bechnology of transmitting production data to direct-access storage device (DASD) farms has been available for nearly 10 years. Airlines, fed-

for nearly 10 years. Airlines, fed-eral agencies and other large nata-dependent users have maintained projectary systems of this kind for some time. These systems were relative-ty primitive, acting as little more han off-site tape vests with communications capabilities. The project control of the communication of the project control of the communication of the state of the communication of the com-nercially fessible.

In fact, electronic vasiting is

men, and menntly, here conversely assistant and a manufactured framework framework and a manufactured framework framewor

HE only ones to make money at felectronic vaulting) are the consultants running

around telling every-one they need it." PAUL CATALANO

DATAPORT, INC.

Services, Inc., with Sunvalt, are

Services, lex., with Searoth, nor defense describers withing to a data center. In these situations, data center. In these situations of the services of the center — in this case, to be serviced dest center — in this case, to be immediately retrieve data from backup framewhole for second control of the center of the 1894, diefer backup framewhole to take drives and the 1894, diefer backup framewhole for the 1894, diefer backup framewhole for the 1894 of the the 189

The thory deciries reading. The thory of excitors we have been a considerable to the control of the control of

Each provider of electronic traveless of the provider of the p

for all its recovery model. Tradi-tionally how the self-site state-tionally how the self-site state. The selectronic vanhing from a The selectronic vanhing from to the same of relater to the season of relateration of the season of

official upor hardyn and storage. These canadatevirtuses in considering electronic vasible and a state of the state of the

dures first? Is it risky to allow your hot site company to also store your vital records? No one but the picential user can answer these logistical and financial questions. In fact, noth-ing about electronic vauling is shoolste right now; the bound-aries of the technology are being drawn as both users and vendors feat their way forward, a

#### Proposal for control threatens halon output BY GLENN YOUNG and ANDREW CLARK

Protecting data centers from fire-related destruction is about to become trickier as a vital com-

to become trickier as a vital com-ponent of the suppression — ha-lon — edges closer to becoming a controlled commondity. The controlled common controlled com-ing fires is a halon system sup-ported by a sprinker system. Halon is a safe, colories, odor-less and noncoderating gas typi-der the floor of a computer room. However, the U.S. recently signed is microsticous on labour college for institutions on labour about the gar's long-term visibil-ty as a fire suppressant.

short the part kings term visibility by a after suppression. In September 1987, a group of 24 nations signed on international protocol, or formally preliminary of 24 nations signed on international protocol, or formally preliminary or protocol, or formally preliminary or protocol, or formally preliminary or protocol, or retrigerates and propolators, the protocol or retrigerates and propolators, and the production of the protocol or retrigerates and propolators, and the production of the protocol or the control of the protocol or the control or production of the protocol or the control or protocol or

Debute to the mark american control of the control

two things happens: the industry finds a substance that can offer the same protective features had no does at the same; protective features had no does at the same; protective features had not seen as the same; production to be raised. Hope for the first occurrence in rather dim, but the second is a real possibility, since the protocol diloves a rathout to increase Graph March 1997, since the production of the policy in the production of the production of the production accordingly.

Handle with care Even though this possibility does exist, data site minagers would be well advised to consider how

ALON is considered less of a threat because it can be tracked and because most supplies remain in containers as a hedge against an event that may not

ever occur. to effectively manage their balor One alternative is to install a

One absentative is to install a pre-action sprinkler system. This system is initially activated by an alarm, which causes piped above the competer your to fill one only when initiated by the heart from each individual sprinkler. Accident-proofing labon systems would be subvisable at this joint to reduce or eliminate the possibility of unintended disposed to the procedure that do not require halon discharges.

codures that do not require halon finchunges.

Unless released by a so-called fine-related event, halon remains contained indefinitely. Statistics green by our memberaners indefinitely statistics green by our memberaners indefinitely statistics green by our memberaners indefinitely. Statistics green by the statistics of the control of the statistics of the control of the statistics. The other 20% was emitted during fire-related events, testing, training and accidental discharges. By diministrating these three types of general presental oriminious, extending the thereby will can pretially mitigaring the effects of the production cap.

cap.

Users should not dismiss halon use out of hand. Living within
the production constraints of
the clean, effective fire suppressant is manageable as long as the
facilities designer and manager
are sware of it and plan a corrective course of action. •

tant at Coopers & Lybrand's Houston

## What is fault tolerance, anyway?

#### BY BARBARA SEHR

When you hear the phrase "fault tolerant" these days, it's a good idea to ask for a definition.

Until recently, the term car-ied with it a very specific mean-ing. It was commonly under-tood that a fault-tolerant ystem was one that featured re-tundancy in its processors, rives and other peripherals, en-ablishing, in effect, a backup

The processors in such a sys-m work in parallel, and its op-ating system noftware is de-pared to sense an impending e in one processor and auto-ally switch the system to

nother. These days, however, as con-rm about protecting corporate formation from the effects of nesters escalate, the term built tolerma?" in being used in a such more generic way to ap-nal to a broader base of users. This the traditional view of a ult-tolerant system has been a odundant parallel processor,

the current market has stretched this definition to in-clude systems that will not break most circum-

Changing times Fault-tolerant systems, intro-duced in 1976 by Tandem Com-puters, Inc., were initially aimed puters, inc., were intratary amed at users who would pay a premi-um for a critical need. Customers were primarily banks and manu-facturing companies that could not afford a breakdown in com-

A number of companies, such as Tandem, Stratus Computer, lat. and Parallel Computers, Inc.; currently market fault-toi-

pass other tirms, such as Sequent Computer Systems, Inc., are now also offering "high reliability without the expense of fault tolerance" with some success, according to Kent Godfrey, quent's manager of market gments. "We find most cusrs do not want to pay the

cost of fault tolerance in ex-

change for the benefits re-ceived," he says. Talk about fault tolerance has even reached the personal computer level, where

on-board redundan-cy is offered. Atlan-tic Microsystems, Inc. has developed a data on an IBM Per-sonal Computer AT hard disk simultaneously to a second

rd disk — tras parent to the user. A ere costly system provides mirrored file servers to a set of two IBM PC ATs on a local-area

network.
Joseph Flack, marketing man-ager at Atlantic Microsystems, says the boards produce a de-gree of fault tolerance that is close enough for most applica-

dent consultant, recently con-ducted a study of the fault-toler-ant market for Frost & Sullivan, Inc. in New York that projects the market for fault-tolerant sys-

tems will nearly double its \$2.5 billion 1987 sales by 1990. That growth, Stafford pre-dicts, will result from the migra-tion of fault-tolerant technology

into nontraditional environ-ments such as the office, with

emphasis placed on the systems' reliability. Stafford, however, makes it clear that he thinks of fault toler-

HEN PEOPLE demand hourly rather than monthly reports, fault tolerance will

become a critical need."

"OFFICE COMPUTING REPORT"

ance in broad terms: "In a way, ance is broad terms: "In a way, fault tolerance is a state of mind." Stafford adds that in many cases, the terminology of fault tolerance and high reliability is used interchangeably: "It's terminology more than anything

Other market watchers who are stricter in their definitions are less convinced that organiza-tions are ready or able to support

ence and engineering depart-ment at the University of Texas at Arlington, maintains that there is an important difference between fault-tolerant and high-reliability systems.

Fault tolerance implies a s nificant amount of redu undancy in major components, he savs.

cal in life

These types of systems are critiening or poten

"If I were on an airplane controlled by a computer, I would want that control system to have a degree of fault toler-ance," Carroll says. The market for

systems that can take over in these situations is still growing, he adds, and will provide expanded growth for fault-tolerant systems in the future

Instant info Patricia Seybold, the "Office Comme puting Rep says the demo ous data could eventua ger the movement of fault toler-ance into the office environment. "It has always seemed that a some point, [fault tolerance would move [into the office]."





When Disaster Strikes. LDI Disaster Recovery Assures that the Beat Goes On





Data Processing Security

200 E. Loop 820 Fort Worth, TX 76112 (800) 433-3240 National (817) 457-0400 Yes

#### ASK THE VENDOR

ne following questions were solicited from users and conveyed to the vendors for responses.

INTEGRITY SOLUTIONS, INC.; Our Min Intractury southroots, Inc.; Our Mirror Inage Processing product family, which will
support the televasting process, will be
delivered during the second half of this
year. It will utilize facilities of our Data
year, It will utilize facilities of our Data
pear. It will utilize facilities of our Data
year. It will utilize facilities of our Data
year. It will utilize facilities of our Data
year. Correctly, Suggested policy
of the Chancel
technologies. Currently, Suggested is
tension technology provided by Data
Switch Core.

Fault tolerance FROM PRECEDING PAGE

STOM PRECEDING PAGE
Stybold say, "specially in critical data
environments such as law firms. When
people demand hourly rather than mostly
by reports, fault tolerance will become a
critical need."

That hean't happened yet, however,
Stybold says she has not since next six
trickle of fault tolerant systems move into
the diffice environment, mostly because
the benefit has not yet justified the cost of
tree fault tolerance.

the office servironment, mostly hexame the bandth into no'y establish the cost of the conduction of the consultant Sufford, According to committee Sufford, According to committee Sufford, March Sufford to the committee Sufford March Sufford to the committee Sufford into the committee Sufford to the committee Sufford into the committee Sufford to the committee of the speculation that IBM would soon develop into the committee Sufford Sufford Sufford Sufford in the committee Sufford Sufford Sufford Sufford in the committee Sufford Sufford

PANAMAX, INC: Our surge protectors op erate in three stages; protection is still erate in three stages; protection is still provided, even if one or two of those stages fail. In the unlikely event a Pana-max surge protector fails to stop a tran-sient surge before it does any damage, Panamax, which offers a lifetime warran-ty, will not only replace the protector but will repair or replace the affected equi-ment. Our 800 number is now marked on all of our surge protectors so customers can constact us in semergency.

can contact us in an emergency.

Insurance Co.

ESSENTIAL SOFTWARE, INC. SHEEMAN OAKS, CALIFJ: Arise Version 1.2, due to be re-leased late next month, provides an inter-face to CA-UCC1 Tape Management Sys-tomatics, constitution, constitution, and the con-traction of the constitution of the constitution of the con-traction of the constitution of the constitution of the con-traction of the constitution of the constitution of the con-traction of the constitution of the con-traction of the contraction of the con-traction of the con-traction of the contraction of the contraction of the con-traction of the contraction of the contraction of the con-traction of the contraction of the contraction of the con-traction of the contraction of the tem. The Arise interface routine creates a tape pull listing of either the current (0) of the direct-access storage device backup tapes. Arise uses the system catal obtain information, which is then pe

Artington, va.

ADVANCED DIFFORMATION MANAGEMENT, DIC: AIM/Safe 2000 requires no other software product and assumes no prior knowledge of any other software. It provides the guidance necessary to create a testable disaster recovery plan. •



## Hot sites

COMPANY	STILOCATION	OPPERS COLD SITES	YEARS IN BUSINESS	SIZE OF SITE (SQ FT)	HOST COMPUTERS SUPPORTED	MICROS SUPPORTED	DATA, TELECOMMUNICATIONS PACILITIES	OTHER PERPHERALS PROVIDED	SITE CAPACITY, NUMBER OF COMPANIES/PIOPLE	SELECTION PROCESS FOR CLIENT COMPANIES	SECURITY PROVISIONS	PROVISIONS FOR OFFLOADING TO OTHER SITES	STT LIABILITY INSURANCI COVIRAGE	ADDITIONAL SERVICES AVAILABLE	INITIATION PER	RANGE OF SUBSCRIPTION FEE	RANGE OF PER DAY/ USE CHARGES
ADE 4	-	140	=	4,300	VAX	Microsox	-	Hard disk, traggards; tops driver; Jan	Pro/25	Separate parties of the last o	Propred	100	Tee	Safrens, bard- tion terrino; or-de	Nese	\$700- \$5,000 per meath	Nane
Allcomp, Inc. (2130 472-0763	New York	Yes	Eight	3,000 or 15,000 (two sites available in New York)	Bid \$300- 3090	BMPC, PC	3725 FEP: leased, dial-op lease; protocol converter; optomal fiber- optos, marrowwe, IRM lafarmation Network	Deals, tage drivers, terminal printers; card reader (peach	Elight/ 90	One per four blocks in Masketter, one per two miles records	Guarde, private work suppo	Yes	Yes	Desster recessory planning business interruption insurance audits property, canality insurance brokerage; insurance brokerage; insurance,	Name	\$5,000 per month	\$1,000 \$4,500
Durling Businey Services, Inc. (PLIP 253-0360	Dynks, Eas.	Yes	354	6,000	Unique 110	New	2,500 planes Stees	Day, tops drive; constitution;	-	One per clay	36-bette pund	No	Yes	Complete Services 24-boar but into Communications Assign, technical andresses	None	\$1,000- \$4,500 pm² mepth	\$100- \$350 pe hear
Codre, Inc. (303) 674-1286	Aren, Com.	No	Seren	8,000	Burroughs 81990, 83966, V380, AS	None	20 dal-up circuits, multiplemers, moderns	Printers, tape drives, 10G bytes of disk	Two per system/ 34	Link by power grid	Internal' external security	No	Yes	Disaster receivery connecting	Name	\$500- \$3,300 per mentà	\$75-\$12 per hou
Carriero Managa Raccino, Marcino, Inc. (212) 000-0000	HOLDER CO.	Yes	~	14,000 10,000	THE DEC.	17-	1,800 LB00 with party ma- few F1, ma- might problem of the face	Maryage Impact, loner printers, 34.30(34400 tapes DALED	2.2		Chall second M-base And	The state of the s	Yes		\$36,000- \$44,000	\$1,500-	\$25,500 \$200,000
Computer Assurance Corp. (404) 655-3993	Cypness, Sun Ramess, Call CO Attenta (two stee)	No	One	3,500 cr 4,400	DG, DEC	None	34 ports of-eile at \$455 bit/sec- via veice-grade lines, customare	DG peripherals	154/50	Based on prograph	Shelded competer room, of-	Yes	Yes	Up to 40 fours free test time, considing	Nene	\$100- \$2,500 per month	\$500- \$2,500
Taw William	OR.	Yes	*	14,000	Amelald Sidea, Sporty 1100/01, Sporty	BMICAT	District State Page	Printers; type, des, DASD drives	1.00(00)		Carl de la carl	100	-		\$1.500 \$10,000	\$1,000- \$30,000 pm	51.257 10.257
Com-Size International 301) 963-1202	Seityville, Seitmere, Md.; Stefament, Seitmere, Pairter, Va.; New York; Cherage, Washington, D.G.; Benton, R.G.; Atlante, Publishing, Md.; Stefament, Publishing, Md.; Stefament, Publishing, Md.; Stefament, Publishing, Md.; Stefament, Stefamen	Yes	10	5,000	SSM, DEC, Roserved Bell, Crey, Ambibl	BM, AT&T, NP, Mac, Frame	Rings of tale- communications hardware from IBM, HCR Counton, Counti, Northern Telecom, Role, AT&T, Wang	CP9; Hales	One-10/ Fire-50	Committee decision hand or contensor non, nature of operations	Security clearation, clearat create TV, 24-hour security	Yes	Yes	Comprehensive design, heald capabilities	MP	NP	NP
Company Devices Into Devices	1	1	м	13,800		THE RC. PC ST. ST. ST. ST. ST. ST. ST. ST. ST. ST. ST. ST. ST. ST. ST. ST.	2 T	Printer, team	-		=	1	-		Q.	E	
Company Assessed	Newtons, Pa.	Yes	Six	6,000	EBM 4300	Nesse	IBM 3720, 3705; Memorez 1270; Paradyse PIX	DASD, Indi- system perspherals	60 per System, 30	One per manufactural part, orban effor	Media September 14 der	Me	Yes	Contingency	None	NP	\$150
Carlos Carries	7	Yes	M	25,000	- C. W.	mer PC. PRO		Distriction of the second	ty and			1			E	V.A	11,000 16,000

"Exact location not provided at company's requ

Print and processor "Direct across storage device "Uninscripted power marrier 400%'s Sentents Network Architecture "Prints branch andre

The companies included in this chart responded to a recent telephone survey conducted by Computerworld. Research assistance was provided by Datapro Research Corp. in Delran, N.J. When a vendor is unable to provide specific information about its product, this is designated NP (not provided). When a question does not apply to a vendor's unable to provide specific information about its product, this is designated NP (not provided). When a question does not apply to a vendor's unable to provide specific information about its product, this is designated NP (not provided). When a question does not apply to a vendor's unable to provide specific information about its product, this is designated NP (not provided).

COMPANY	RITLOCATION	OFFERS COLD SITES	YEARS IN BUSINESS	SUZE OF SUTE (SO PT)	HOST COMPUTES SUPPORTED	MICHOS SUPPORTED	BATA, TELECOMMUNICATIONS MCLITIS	OTHER PERPERALS PROVIDED	STE CAPACITY: NUMBER OF	MUSCHON PROCESS FOR CLIENT COMPANIES	SECURITY PROVISIONS	PROVISIONS FOR OFFLOADING	STELLABILITY INSURANCE CONTRACT	ADDITIONAL SERVICES AVALABLE	HETTATION ME	BANNE OF SUBSCRIPTION FEE	RANGE OF PIR DAY/
Designant, Inc.	-	140	-	4,000	March Str	-	100 Sans com	Shell Bagle In drives, topic drives, present UFS	75/96	-	-	-	Tes	=	-	\$1,300 \$2,150 ps	-
Datapund Recovery Services, Inc. (502) 368-2501	Lauderelle. No.	Yes	Pour	15,000	Hoseywell bull DPS a, DPS a, DPS a, DPS so DPS acco	BM PC, PC	Disi up, Accus reserve T1, switched 56 to lines; E.25 network	Protons, card renders; packers; date tape drives	МP	None	Entry security, security petrois, finios, water despection, LTPS	Yes	Ton	Vault security, effice support, deserter recovery constaltation	Near	\$350- \$17,500 y mend)	\$350- \$7.566 per day
Data Processing Beauty, Inc. 0017) 487-4400	Part Wards, Them. Sant Labo City: Tables, Other Interest City To City Tables, Other Interest City City City City City City City City City City City City City City	700	Ne	8,000 33,660	GBC, Ameldia Dates Gan market NCR	BM PC, Page	2004	Tape, dick driver, contamporary, communication emissions	100V 100	Se manion within the min make of each min	Dries for description, descript TT configure, 24 lane membry, water description descriptio	You	Yes	Off-she storage diseases diseases privatelles, privatelles, leading continued on a reconstruction.	-	1540 22,500 pm	1000
Digital Equipment Corp. (617) 493-3467	Risco"	Yes	Pine	40,000	VAX 8650, VAX 750, PDP-11/70	DBC	Tyrmet packet switching, X.25 SNA*, Discuss net works		MP	Based on Customer demond	Card keys, hedge readers	Yes	Yes	Contingency planning, training, data protection center,	м	ИP	NP
	New Jersey*	Yes	Three	40,000	VAX 8650. VAX 780, PDP-11/70	DEC	Tymest packet switching network, direct did lines, Talenat	NP NP	MP	Based on customer demond	Card keys	Yes	Yes	Centingency pleasing, training, data presection center, media	MP	NP	ХP
Manufac Architecture & Manufacy Services, Inc. 213) 364-8230	Arlington Finglets, IL	Yes	Too	7,000+	Amelahi, IBM, HAS	Compatition Compatition	1,110 revised wire, Accessed reserve T1 line	DASID, tope, printers	50/120	One per	Any september by subscribers	Yes	Yes	Automoted Source measury tools, counting, moles,	\$36,660	\$1,000- \$20,000	\$27,000
Dissator Control, Inc. 215) 355-7800	Warminster, Pa.	Yes	Nine	10,000	Unary A15, V380, E1 100	Unique SQD	150 disl-op, T1 switched 50 kb, inseed inco	Printer, disk, tape drives; moderns	NA.	One per building er city block	Combina- tion locks, electronic	Yes	Yes	Software	None	2500- 27,000	Varion according to equip ment un
II Cambro Resources Led 21 to 205-0000 to Cald ; 2004; 251-0230	Mercheiden, Colff. Irven. Colff. pleased for fearth quarter	Yes	20	2,000	State Adjusted Adjusted State In Section 1988; DRCC in Section 198	BM PCs, PS/2: Mic	10 del up linas	All associated perspherois for AS/460, System/38	160	Part comp. first sorve	Pul oud- destalty of adaptions have	Yes	Yes	Hardware re- placement within live days, dissolve recovery placement; Design & Lesser on used, new Bild, DEC epispenent	\$1,500	\$150-bace monthly les	No charge face 30 days
Paet Track Systems, Sec. 212) 422-8680	Sew York	Yes	114	2,600	DG computers	DG; BM compatibles	60 dal-up lines. 2,200 loar-wice full-depice cabins	Printers: 648, tape drives, communications equipment	No limit	Case by cas	24-hour secunts, estry shreed, clean-cross TV. Raine-epspeed bath-type realits	Yes	-	DEC opsignment Off-side eterrage, electronic veniting, constitues alongs specialists, private specialists, private planes network, opsignment	Determined by configuration	Descrimed by configuration	Deter- smed is configur atom
	Brooklyn, N.Y. (operational lint quarter 1988)	Yes	114	7,000	competers	DG; Stat compatibles	170 del up lines 4,400 leur-wire full-depies cables	Printery, disk, tape drives, communications equipment	No Inni	Cate by case	Some as above	Yes	Yes	Seese anabove	Determine of by ope- figuration	Determined by configur- ation	Detar- remail by configuration
	Ciscago	Yes	194	2,200	-	DG; IBM compatibles	15 dial-up lines, 900 four-wire fell-deplex cables	Printers, disk, tope drives; communications equipment	No limit	Case by case	Same on above	Yee	Yes	Some as above	Daternan- ed by con- figuration	Determined by configuration	Deter- smed by coefigur- ation
net Conneiting levelon, Inc. 1037 454-7610	(Em) Besten	Me	T	6,000	IBM 6901, Price 750	-	Through the same of the same o	ASCII protocol emprepter	Pou;26	One per tree special blocks in oldy, one per min special	Card access, general security procedures	Yes	You	None	New	9750- 94,000 per mentils	2304
19) 460-1234			Eight	28,000		IRM PC, PS/I		Disk, tape drives, impact, laser printers	100+	One par building	Canwra per- veillance, code locks, georde, tape vapits	-	Yes	C-based parameter process, pro		\$605- \$3,060	\$3,500- \$4,500
				24,000	9 /			Disk, tape drives, impact, laser printers	100 per config- contine/ 100+ per uts	One per building	Some an above		- 13	references		\$995- \$3,050	\$2,500- \$4,500
	Tewlabury, Mass.	Tes	Eight	12,000	DEM maintranen	IRM PC, PS/2	1,300 be/sec. to 71	Desk, tape drives; stepact, leaser printers	100 per config macion 100+ per cip	One per building	Same on above	Yes	Yes	C-board densing services, relectorable	\$5,000 \$15,000	\$905- \$3.050	\$2,500- \$4,500

COMPANY	STELOCATION	OPPRES COLD SITES	YEARS IN BUSINESS	SEE OF STEE (SQ.FT)	HOST COMPUTERS SUPPORTED	MICROS SUPPORTED	DATA, TELECOMMUNICATIONS PACELTIES	OTHER PERIPHERALS PROVIDED	SITE CAPACITY, NUMBER OF COMPANIES/PIOPLE	SELECTION PROCESS FOR CLIENT COMPANIES	SEQUETY PROVISIONS	PROVISIONS FOR OFFLOADING TO OTHER SITE	SITE LIABILITY INSURANCE COVERAGE	ADDITIONAL SERVICES AVAILABLE	INTIATION TE	MANOR OF SUBSCRIPTION FEE	RANGE OF PIR DAY/ USE CHARGES
19T Computer Services Co. 05140 2003-1611	11	Yes	Three	2,000	mid	Does not materia, has 1984, blue on alter	Ti. dat up has	Disk, cometts, tape drives; impact, later printers; controllers; punch card readors	S per contract to the contract	Come by com	Stitum sound; sound; drugs constant dre restrict dreat restrict dreat	Too	Yes	Compling of views application backey, demand of views training	Hean	Starto at \$1,500 per month	MP
LDI Diseaser Recovery Corp. (216) 345-0901	Seine, Clear, Concinent	Yes	Fire	22,000 (Seleni); 16,000 (Cincinna ti)	BM, Unry (Rarroughs)	и	600 data pair, 300 voice lanes, Accused reserve T1 lanes	3,380 single, double-density DASD; tape drives; laser printers; check processin;	100/ United ted	One per building	24-hour mentioning metion, muche, has detectors; secure access; fire aforms	Yes	Yes	Pleasing, consulting, technical support; emergency check processing	NP	NT	NF
Barriery (1900) 483-8898	Princeton, IV,I	His.	Pour	2,000	MCR	SC-20	23 dans das beckup lines, con 2,400 hit/sec. sysciences das op line	Disk, tope drives; present; cord, countle reader	30/16	One every six miles on obsciring minimize		No	Yes	Monte	Three- month milecrip- tion too	\$2,000+	\$1,500 per day
NCR Corp. (513) 445-3836	Deyton, Ota	No	There	4,500	NCR V, I acries	NT	150 AT&T disk- up lines, Accurae reserve T1 lines	Disk, tape drives; sorter; printers	50/20	NP .	24-hour guerd, electronic nerved- lance, badg- readers	Tee	Yes	Dinaster receivery pluming, tape, dek, forms storage	None	\$5,000- \$150,000	Based to hardwar configur stion
Options Corp. (400) 381-0000	Set Joon, Call.; Kanan City, Ma.; Secution	No	Pos	40,000	VAX. Cyter, Cray	SIM PCA POST Mar	Dal-sp face	Disk, tape derves; printers	20/100	One per 20- mile reduc- for dedicated service, for yer a 20- mile redise- for time- dering	NP	Yes	Yes	The sharing, software development	\$2,500- \$10,000	Up to \$2,600 per possib	\$10,000 per days actual samps,
Phoneix Services, Inc. (617) 963-0500	Levington, Mass.	No.	Fine	NP	Prime	None	Eight dial-ep lines	Tape, dut drives, presters	16/10	None	NP	No	ΝÞ	Time-sharing	кт	NP	MP
Land Con-		No	Three	11,000 Cleaks- tone); 5,500 (Celgary)	1100 Chalupe	Depends on chest requirements	26 Same	Disk, tope driver, printers	Vertices by miles	Determined by prographic mass	Card scoon security parts, will scoonse- date client	Yes	Yes		Varios	\$2,000 \$14,000	No making day pos for first oight weeks
Inc. (205) 423-8901	Orlando, Pla.	Yes	1%	13,000	Unarys	None	60 dad-up, three switched 56 in lines; T1 multiplement	Tupe, disk drives; proters	30/40	Seed or geographic ares	Total mentering	Yes	Yes	Time shaving	\$1,000- \$2,000	\$2,000- \$8,000	Paned or hardwar configur store
(710) 105-0510	Rochester, N.Y.	No	15	2,000	IRM, NAS	mu .	Op to 200 dail- up lines	IIIM 3705, 2725, Xarras beer printer	73/90	Depot on individual risk analysis	Capif access	16.	Yes		\$10,000	\$1,000 \$5,000	97,000- 95,000
Songard Recovery Review, Inc. (2001 533-4970	Philodophia, Olicago, San Diego	Yes	10	45,000- 100,000	ISM 2090, 3003, 3091, 4391; WAZ 8800, WAZ- 11/785; Tandem VLX, TEP	None	9,000 cable pairs; 11.T1, two T3, 16 owitched 56 th lines; full array of deal backup lines	Laser printers, classed extenders (all associated IEM, DEC, Tandess pergiberals)	110/ 200 / 0°mil.t 110/ 100 (Chica- got: 110/05 (See Diego)	One par building	Card score. 24-box security, closed- circuit TV	Yes	Yes	Contegency - pieneng, electronic reuting	\$10,000- \$25,000	\$1,500 \$15,000	\$2,000 \$13,000
AND DESCRIPTION OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWIND TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN	Logi black	16	Two	OCT &	DG	TIM PC, PAGE	Al dainy has		The state of the s	Charper Impails miles	*	20	Tes	Hill	\$1,200	12,000 per 12,000 per	\$1,500 per day
Systematics, Inc. (501) 223-5054	Lattle Reck, Adk.	Yes	Flore	25,000	IBM 4300, System/76	BM PC	IRM 2706/2725 communications controllers, 14 dial up lines, overched 56 to lines	Disk, tape drives, DASD, printers	120/07	Systematics manage- arest, neft-repre clients; other financial institutions on pelective	24-bear security, card access, closed- circuit TV	No	Yes	Phoning services	\$10,000-	\$1,000- \$4,000	Up to \$4,500 per day
Arrian Con.	-	No.	The	1,000	Many 175	7	Marin, Marin Market	-	7		Marian Series	10	San	=	E14,500		12.50
Epochamor Systems Systems Barrary Services (200) 054-0547	Search	Yes	Three	400,000	ISM 3090, 2080, 4306, System/38: siff 3000; Beat DPS 8, DPS 8; VAX: 11/780, PDF-11/70	ЭМ	100 + dai-up circuity, T.I. S. T.25 ectworks: Reperhanser Data Network (X.25 and SNA); modern; multiplicators	DASD, tape storage devices; printer for ISM, Roseywell Bull, HP, DEC: ISM, Hoseywell Bull card readers	Mass/ 180+	One castomer per config- sartras per building, 48 customers notal per configura- tion	Compressor- vediance, restricted basiding grounds access, electronic card access	No	Yes	Econote testing, business support, reduction susistance, recovery consulting	None	\$750- \$5,000 per month	\$1,750- \$5,000

# HAVE WE GOT NEWS FOR YOU!

Extra! Extra! Read all about it — in COMPUTERWORLD], the newsweekly for the total systems picture. You need the most up-to-the-minute news. Hot off the presses. While you can still use it. Not a week or two later.

#### And COMPUTERWORLD

delivers — right to your desk.
We keep you on top of all the latest
news, products, people, developments,
trends and issues — things professionals like you need to know to get ahead.
And stay there.

#### More good news.

SPOTLIGHT, a regular section within COMPUTERWORLD, details a single product category — LANs, printers, financial software, security products, graphics workstations. Each SPOT-LIGHT includes surveys of key vendors and head-to-head product comparisons with an at-a-glance ratings chart.

#### Get your own copy.

You can't afford to wait for the hottest news in the business. Get your own copy of COMPUTERWORLD. 51 information-packed issues. All backed by our no-questions-asked Money Back Guarantee.

#### 12 bonus issues of COMPUTERWORLD FOCUS

Order now and you'll also receive 12 issues of COMPUTERWORLD FOCUS, each one dealing in-depth with a single vital topic — Connectivity, Departmental Computing, Data Security. All FREE and ONLY for COMPUTERWORLD subscribers.

## Call toll-free 1-800-255-6286 to get your own copy of

COMPUTERWORLD.

And get the late-breaking news before it's too late.

indows open to 80386 power High-octane Microvaxes roll

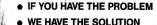
And

Lack of unity endangers the promise of DAT

In June 2015 And 1985

In June 2

# DISASTER RECOVERY PLANNING



CHI/COR'S TOTAL RECOVERY PLANNING SYSTEM (TRPS) is a relational database tool on a personal computer that:

- Makes it easy to enter your data
- Organizes and manages that data more effectively than any word processing system can
- Provide you with an already-documented, detailed action plan
- Makes it easy to maintain your Disaster Recovery Plan as your environment changes

TRPS is the most advanced disaster recovery planning tool available. It is the only system that effectively addresses the issue of maintaining Disaster Recovery Plans for organization-wide or data center planning programs. TRPS is compatible with all recovery environments and is not tied to any single vendor's offering.

#### CHI/COR'S DATA SET ANALYSIS SYSTEM (DSAS)

- Reads and analyzes System Management Facility data to identify data sets that must be off site to successfully recover applications at an alternate site
- Interfaces with tape management systems to identify that the required data files are backed up and available at your off-site location.

#### CHI/COR'S RESOURCE ANALYSIS SYSTEM (RAS)

 Identifies the minimum computing resource that will be required to execute one or more applications at an alternate site

ALL PRODUCTS BACKED BY TRAINING AND SUPPORT

For Free Demonstration Diskette and/or More Information Call:

1-800-448-TRPS 312-454-9670

CHI/COR Information Management, Inc.

10 South Riverside Plaza, Chicago, Illinois 60606

## MANAGEMENT

#### TAKING CHARGE Les Gilliam

#### Facing the Fear Factor



meent on any one part of organisation or the person in ge of that function. uch is the case in many punies today, where the ability of the on-line sysis necessary to serve cus ers. Executives are very

lost is only rarely re-

up. at one executive fears that cost of or dependence on a player could jeopardize the pany's fature, he will try to that fear in some way. Or-ustional or personnel ges are often involved in solutions.

such solutions.
Further, the executive may endelled with a certain discount, knowing that if the comster system fails, he is at the ercy of someone else to find diffic the problem. Executives not like to feel powerless.
The Fear Factor will be at its

### Charged-up DP shops embark on hiring spree

CLEVELAND - The end of several years of financial stagna-tion and the introduction of new tion and the introduction of new technologies such as electronic data interchange (EDI) will fuel increased demand for data pro-cessing workers through the rest of this year, according to a necessary learn from sonnel search firm.
"Companies that have been

"Companies that have been somewhat stagant or even inying people off during the past couple of years are moving forward with a lot of brawdo. This is probably one of the more dyname: times is the history of the data processing industry with respect to the number of people being laired to implement new being laired to implement, and the processing division of clavestoned of Companies and the processing division of Cleveland-based search firm

Management Recruiters, Inc. Compusearch said 1987 had been a year of stabilization, while the first half of 1988 was a time

the irrst half of 1988 was a time of improvement.

Bleasing cited the example of EDI as a technology that can drive the demand for new employees. As companies demand that their suppliers implement EDI, those suppliers must enhance or replace their computer systems if they wish to remain connectivity.

levent industries and found that 37% plan to increase their staffic, 51.6% plan to maintain current staffing levels during the last six months of this year. Only 10.9% of the companies said they are planning to cut their MIS staffs in the second half of the year. Furns specializing in DP, such Continued on page 60

Data View



## A graphics pioneer

Langridge's expertise shapes molecular models

#### BY J. A. SAVAGE

Most people would look out their grimy office windows and give only passing thought to air polation. Not Robort Langridge.

When he moved into his 10th-floor office overlooking San Francisco's Golden Gate Bridge and the Pacific Ocean, Langridge and the Pacific Ocean, Langridge

removable and the control of the con

rounation. Instead of minitaring computers to process financial data, he maintains systems and develops software to process enormous computations; these computations create dynamic models of proteins, which take on beautiful shapes and col-

And instead of a DP staff, he employs 12 graduate students and staff and lets hundreds of vis-iting medical researchers from all over the world access the

#### PROFILE Robert Langridge



partment supports a Digital Equipment Corp. VAX 8650, two DEC VAX-11/150s running the University of California Berkeley's Unix 4.3 and a Sym-bolica, Inc. 3600 LISP-based

Graphics are supplie through an Evans & Sutherina Color Picture System 2 and Picture System 350. Graphics are managed by silicon Graphics, Inc. In 2400Ts and an Evans & Sutherina System 2 and Evans & Sutherina & Su

land PS390.

Langfridge also uses a Convex.

Computer Corp. C1 minimiger

computer and 95 sm Microsystems, Inc. workstations. For se
rious number-crunching, he says

he borrows time on a Cary Research, Inc. Cary X-MP/48 b)

cated at the San Diego Super
computer Center.

Office space is provided by

the medical center, and the com-

The FOCUS Top Gun School is for advanced ut of FOCUS, the leading 4GL/DBMS. This school prov the most intensive FOCUS training ever given by brit

p Instructors —Chosen from IBI's best FOCUS nsultants, teachers, and developers. Top Curriculums — Advanced Application Development FOCUS Internals for Efficiency made up of 31 core

Top Students — Designed for senior FOCUS developers, support staff, and advanced and users. No beginners please.

Top School — The first Top Gun, held in New York, set a new standard for FOCUS education. Anaheim is next.

#### @FOCUS = DP GUN SCHOOL" for

High Performance Information Builders' Elite School for Top FOCUS Users

August 21-25, 1988 Anaheim, California

The Anaheim Top Gun takes the best of the first school and raises the standard even higher Attendees were

"The first school proved to me that iBI delivers what it provises. It takes the best to train us "Top Gurs"... there is NO WAY I'm oping to miss the Anaheim session!" Kevin Dugan, Idaho Power Compar

For more Information, contact the FOCUS Top Gun Registrar at 212-736-4433, ext. 4745

Information Builders, Inc. 1250 Broadway, New York, NY 10001

#### **Pioneer**

CONTINUED FROM PAGE 59

anditioning.

A schematic outside the computer our maps the equipment for new starts. And to help them remember which action in which, they are all coded with mens of philosophers. The Convex C1 is ato, Socrates governed to Hopelin the Polymer of the Special to the Special to

erland LDS1. In 1976, despite the opposi-tion of his chemistry colleagues, Lan-gridge employed Unix. He moved the lab to San Francisco in 1979. in 1979.

was in 1957, however, that Lannt was in 1957, however, that Lan-gridge started toying with computer graphics. As a graduate student working with Nobel prizewinner Morris Walkins in 1955 at Wheatstone Physics Laboratory at Kings College in London, he developed his thesis on how protein molecules are

nas mess on now process moscuses are structured.

"I was doing things with hand calcula-tions for X-ray diffraction. It would take two weeks of hand calculations for one structure," be says. The illustrations in his thesis were also painstakingly drawn In 1956, a colleague told him of an un

used IBM 500 moldering in a warehouse med iBM 500 moldering in a warehouse merically, since there was to assembler, Langridge was able to de two weeks Langridge was able to de two weeks of the control of the control

Langridge and Princeton received \$750,000 — as ecorrows amount of money at the time — to set up their scientific computer graphic center. Langridge we do computer still flies in the face of traditional academic research. "Offser escentistic don't think much of computer graphics they think they're just pretty practices. But it helps alway barriers to understanding," he

pall away partners to understansame, as eggs. The surfners design and produced the surfners design and produced handles does not come easy, adopted a surfners design and produced handles design and produced handles and adopted an amagnation and an adopted an amagnation of the adopted and a surfners design and a surfn

## Charged-up

service bureaus, showed the strongest ring treads, as measured by the per-nitage of firms reporting planned staff creases — 62.9%. Other industries ex-feding the national average of 37% in-ted printing, agriculture, finance, re-mining and ne of the ind

sizes, while weater grown as an accountain states.

Blessing said the type of employer tught by companies has changed in rest years. Firms had sought specialist is BM's DB2 and Cultinet Software, c.'s DMS/R, he said. "Now they have considered to the property of the prop med their specificat



"Of course we have a service plan, Chief! I only have to call 22 different companies."

#### LEASAMETRIC Data Communications

u can get a complete service plan for all your PCs, peripherals, and network products. All from one compa ametric. No matter where your equipment came from. To find out more, call the nearest Lessametric office. wei: (800) 343-7868, (415) 578-5797 • Southwest: (800) 638-7854, (888) 708-2669 • Central: (800) 323-4823, (302) 598-2700 Northeast: (800) 221-0246, (201) 825-9000 • Southwest: (800) 241-3841, (404) 925-7980

# The most important link in our business software system.



Today everyone talks about connectivity. Computers talk to each other. And business software companies talk about their latest advances in bringing it all

But despite their technical skill in linking PCs, mainframes and mid-range systems, most software companies fail to see the importance of connecting with you. And everyone else in your company who touches a keyboard.

The result? Inflexible business applications that cause nothing but confusion. As people struggle to learn the software, meet tight reporting deadlines, and stay out of your DP shop's way all

At McCormack & Dodge, we made the connection with people years ago, and Millennium® was the result. Business soft ware that allowed people to work in a

Now, that technology has evolved into customer-controlled software. A line of business applications you can easily tailor to your individual needs.

Consider our General Ledger package A retailer might turn it into a weekly: stock ledger while someone in the Chl & Gas industry sets it up for project reporting. On the other hand, our PC Link software lets any user develop custom menus, and follow a work flow that best reflects their business

It's all accomplished without the cuitomary confusion And it all comes from a software company consistently rated by Fortune 500 executives as a top vendor in overall service and support

If there's a missing link in your busi ness software system, maybe you should consider customer-controlled software To find out more about it, or any of our Financial Human Resource, Manufacturing, and Application Development systems, call McCormack & Dodge at 1-800-343-0325.

We put the customer in control of the software

M\*Cormack & Dodge



# OF BRANCHES TREE:

keep a

was designed to our diagram our diagram

strategy to

NOR NOR

#### Gilliam

FROM PAGE 59

install its initial in-house sysso many unknowns and uncertainties about the system and staff that it will contribute to heightened anxiety about the

project and its risks. Similarly, if the info

systems staff is installing the first on-line system to serve re in real time the eve utive will be careful in approving - and concerned in imple

The other two critical points for the Executive Fear Factor appen when turnover occurs. If a new executive is appointed to

oversee the information systems function, be may step into that responsibility looking for some type of security blanket. He may even cancel or postpone plans or projects that we already approved by his prede-

Similarly, in the same si tion, the new manager's lack of proven leadership and loyalty can raise doubts in the minds of

tives. They may estab lish and maintain the Trust Faca backup plan in case the new manager fails. For certain, executives will be hesitant to become overly dependent on the new manager until a trial period as passed. What can the information estems manager do to minimi e Executive Fear Factor and

ereby bolster his own career

that staff.

tor. This refers to the executive's trust in the technology, the system, the information systems staff and the manager of The information systems manager should take the initia-

tive to eliminate or minimize replace it with the Trust Factor. The Trust Factor is built on three major pillars: knowledge, performance and communica-

The starting point is to initi

HAT CAN the information systems manager do to minimize the Executive Fear Factor? He must establish and maintain the Trust Factor.

ate a face-to-face discussion with the executive to pinpoint con-cerns and then develop specific plans designed to address each

ffering from a lack of knowl edge about the technology and the systems being used. Vendo seminars are available to help build a technology knowledge base. Presentations and demstrations can be used to in-rm the executive about the dication systems. Users should be involved in the latter to support the importance and dependability of the systems.

dependability of the systems.
Performance of the staff, the
system and the manager should
be self-explanatory. The problem lies is knowing the standard
against which each of these is
measured. Again, initiative on
the part of the information systems manager may be required to set goals and measurement

Above off, tolk Of paramount importance is communication. If the execut is not kept informed, he may pect the worst about info on systems. Direct and regu lar communication about of

If there are intermedi

the information systems man-ager and the executive, it is vital that the complete truth be passed up the ladder. But communication should not be limited to the printed page. Face-to-face discussions are much more valuable. A frown

may be worth a the



#### Why Retire Ribbons So Young? You save printer down time and

Why let your ribbons get old and gray before their time? Keep them producing bar code quality six times longer. For half the cost! A new Ribbon Saver re-inking

system added to your Printronix®or other high speed printer continuously rejuversates your ribbons as they print. Ribbon Saver systems release precise es of high resolution ink onto

ribbons to give you continuing scannable quality and clean, troublefree operation



Roller A releases ink to transfer roller B and detooits it evenly onto ribbon C

RIBBONSAVER

CHIC haden for Miles Soor a sentencia of fraction for

operator labor too. A single inexpensi

and keeps one ribbon as young as six

ribbons earn their keep! Ribbon Saver

Ribbon Saver" Saves You Plenty

Gould Dr., Cookeville, TN 38501.

Marketing Services, Poreion, Inc., 1480

ne wones.

615 432 4032

I PONICON

Ribbon Saver ink roll installs in seconds

With Ribbon Saver on the job your

#### MANAGEMENT BRIEFS

## ACM taps Kocher as president, White as VP

The Association for Computing Ma-chinery (ACM) recently elected Bryan S. Kocher. service ent at Consulnts for Management Decisions in Bos

ton, president for a two-year term ton, pressoem for a two-year term. Kocher, who previously served as Northeast regional representative on the ACM Council and clusimum of the ACM Boston chapter, began his term July 1. He ran on a platform calling for action to set new directions for the association "to make ACM the preeminent computing so-ciety." He said his top priority is to estab-

lish distinguished panels to speak out on key issues such as the Strategic Defense ative, Section 1706 of the U.S. Tax Code and government funding for o

John R. White, acting manager of the Xerox Palo Alto Research Center's Com-puter Science Laboratory, was elected

Sara A. Bly, a member of the research staff at the Xerox Palo Alto Research Center, was elected ACM secretary. White has been chairman of the ACM Special Interest Group Board. Bly has seen active in the ACM's Siggraph con-

Information systems profe insurance industry recently announced the formation of the Insurance Systems Management Association (ISMA). Membership in the management

#### CALENDAR

o 71. Chicago, July 17-22 — Contact: Gui of Corp., 111 E. Wacker Drive, Chicago, 21. 6 Colo bit 15.19 - Cont

category of ISMA is open to the lead ation services function, their immediate superiors and the front-line ager reporting to the MIS executive. ng to executive director Ray Abi. Other information systems may

category.

Abi said the association's programs are rected at increasing the effectiveness of formation systems and technology in the insurance and financial services indus-try. He said ISMA will sponsor an annual conference, roundtable meetings, an executive forum, a vendor forum, sen

and research studies. Managers interested in joining should contact Ray Abi, ISMA, P.O. Box 446, New Canaan, Conn. 06840.

Several calls for papers have been issued for conferences to be held later this year din 1090

The International As uter Operations Manager issued a call for papers for its "Focus on Operations — IX" conference, which is iduled to be held in San Diego Feb. 27-March 2, 1989. Papers or synopses may be sent to the association at 742 E. Chap man Ave., Orange, Calif. 92666.

The Association of Hus source Systems Professionals is so liciting workshop presentations for its an nual conference, which will be held April 17-19, 1989, in Houston, Interested participants can contact the association at P.O. Box 8040-A202, Walnut Creek, Calif. 94596.

Papers are being accepted for the 1988 AEC Expo, which focuses on the automation needs of architects, engineers struction professionals and will be held Dec. 6-8 in New York, Se may be sent by July 29 to Sandy Krueger, conference director, Expoconsul Interna-tional, Inc., 3 Independence Way, Prince-ton, N.J. 08540.



#### Buy The One On The Left And You'll Have To Put It Where The Sun Don't Shine.



The monitor on the right. however, can be placed anywhere you like. Even in direct sunlight, It's the new Flat Technology Monitor from

Zenith Data Systems-winner of PC Magazine's coveted "Technical Excellence Award" in the hardware category for 1987.

You Have To See Zenith To Believe It

So clear. So precise. So lifelike. It's the only monitor with a completely flat screen. A breakthrough that has redefined monitor quality forever. Industry experts are already convinced. And once you see it in person, you'll be a believer too.

Bigger, Brighter, Glare-Free

Our Flat Technology Monitor has an impressive 14- inch display. And even though it's bigger, it's 50% brighter than conventional CRT's and it has 70% greater contrast. So you get colors with greater depth and definition that make your reports, charts and graphs come alive like never before.

The Flat Technology Monitor is virtually glare-free. So you can work longer without the usual headaches

and eyestrain. And that means greater productivity. But to get the whole picture, you have to see it with your

Backward And Forward Compatibility You also get full compatibility with the high

resolution VGA Video generated by IBM's new PS/2\* computers. And with Zenith's Z-449 or other VGA-class video cards, you can enjoy CGA, MDA, Hercules and EGA graphics as well Experience Zenith's Latest Technology Breakther

Obviously, a mere picture can't do justice to our new Flat Technology Monitor, It demands a face-to-face evaluation. For a hands-on demonstration, call today for the name of your nearest authorized Zenith Data Systems dealer-the Flat Technology Monitor is available in quantities right now.

1-800-553-0305



C 1988 Zeem Com Com

MAIT. WAIT. WAIT.

THE WAIT FOR THE IBM SILVERLAKE IS OVER.
SO IS THE WAIT FOR NATIVE
SOFTWARE SOLUTIONS.

## INTRODUCING AS/400 SERIES MANUFACTURING AND DISTRIBUTION SOFTWARE. AVAILABLE NOW.

If you thought you'd have to wair for IBM AS/400 native software, wait until you read this. Arthur Andersen & Co. has your business system available today MAC-PAC.\*
FIN-PAC.\* and DCS\*—our series of integrated systems for the IBM AS/400. They can help you maximize the efficiency of your manufacturing, finance and distribution operations. Plus, they are backed by the service, training and 35 years of software experience of Arthur Andersen & Co., an organization committed to helping businesses manage toward the future. For more information, call 1-800-458-8851 or 312-507-6588.



## COMPUTER INDUSTRY

INDUSTRY NSIGHT

William Zachmann

#### AS/400 no messiah



cent messish has been received. Maybe it's got something to do with the approach of the third Christian millennium. Maybe it's the coreing of the Age of Aquarina after all. What I am talking about, of course, is the wave of apocatypic centhusians with which BMS are McAydo mid-range processors have been herabded baba. Lord have mercy! The days of trial and tribulation for the industry have? I even started yet, and everyhody's looking for the messish.

Nowhere was this more dra-tic than on Wall Street. matic than on was scree.
There, in the land of the sugarplum fairy and the yum-yum tree
— to say nothing of Ivan
Boesky and Gordon Gekko —
IBM shares suddenly, in anticipation of the blessed event, be-

The question that keeps thering me, however, is bothering me, nowever, is whether there is any there there. To he perfectly frank, I still haven't the foggiest idea what it is that everybody seems to he getting so excited about. IBM's AS/400 announcement ms to indicate little more ms to indicate little more in that IBM is likely to stay in business of selling mid-Continued on page 76

## Tandem CEO refocuses efforts

Treybig looks at big picture in wake of Ungermann-Bass purchase

BY J. A. SAVAGE

CUPERTINO, Calif. - Ja

I anneo and relatively relaxed after returning from a month of ham radio operation in Aruba, Treybig, the chief executive offi-cer of Tandem Computers, Inc., has disentangled himself from the deviced.

has discretangled binned from the day-to-day operations of the billion-foller company. Getting free in last month's company reorganization was about the last thing he did before his vecation. In the contract of the conduction of



Jones G. Treyrog centrate on major problems and not little problems, "he said. "An you get bigger, you have to work hard to keep things like creati-ity and innovation — all of the things that you lose if you are run by! Harvard MBAs." Treytic commented that one area of creative synergy be-tween the technologies of Tam-dem and Ungermann-Bass is the recovery of a fault ciderant local.

area actual.

"ANs terral designed for PANs terral designed for power failure," he said: "So if the power fails is building, everyone has to redo the LANs. If the power fails is a building our case power fails are studied our case back. It would be worthwise for Kingh (Dagermann) and I to do that, but to do that: I made ince."

In the power fails of the

lancem, which was count on ob-line transaction processing, is at-tacking the inherent problem of Unix time-sharing by developing a system from scratch, although it is using AT&T's Unix System

#### Cherney rejoins ex-CMIers

BY CLINTON WILDER

BLOOMFIELD HILLS, M BLOOMFIELD HILLS, Mich.

One your after losing a bitter
battle for ownership of CMI
Corp., Edward Cherney returned to the computer leasing
industry inst week to head the
firm founded by former CMI ex-

irm founded by former CMI ex-ceptives.

Chermey joined Encore Inter-national, Inc. as president and chairman. Encore International was president and chairman. Encore International transport of the Company of the Chermey at CMI (SWI, Sept. 14, 1987) but let Aister rival lesson Continental Information Sys-tems Corp. (CSI) was a court de-cision allowing it to buy CMI for Encore Corp. (CSI) and Con-tain Corp. (CSI) and Con-tain Corp. (CSI) and Con-tain Corp. (CSI) and (CSI) and (CSI) but CMI (CSI) and (CSI) and (CSI) but CMI (CSI) and (CSI) and (CSI) continued on page 70.

#### **Data View**

Changing tides

×	Maria Commission of the Commis	
3	Pairchild Samiconductor	Todale .
	Pidge	Black -
4	National Semiconfuctor	Monorola .
	hed	Trees Instruments
	Meterola	Politica
97	MBC	Philips
- 8	General Instrument	intel
	RCA :	Mitmidd
. 10	Rockwell	Mataubita
Secol or reprise	of units and	

#### Buy-out spices up VM market

BY NELL MARGOLIS

For the past several years, BM's VM operating system utilities matter has been specialised yet steepy siche, mined successfully P. Renton, Va. based VM Software, Inc. and a few lesser known players. But in 1985, the market has heated up quickly, "Usell recently, VM was the Rochey Dangerfield operating system; it got no respect," said

Brace Mancinelli, vice-presi of marketing at VM Syst Group, Inc. Arlington, Va.-b VM Systems late last m vaulted into the No. 2 spot in

vauled into the No. 2 most as the market by acquiring Kolimir Corp. in Seats Clarz, Calif., for an undisclosed amount. What is causing the VM mur-let to change, Manciell said, is a series of supportive signals from IBM. § "The inclusion of VM under Continued on jungs 72

## National Semi financials disappoint

BY JAMES DALY SANTA CLARA, Celif. - Al-

though the pulse has returned to National Semiconductor Corp.'s National Semiconductor Corp. 'a cooc-gasping semiconductor business, the company still can-not completely spring to life and recently reported financial re-sults that were well below ana-lysta' expectations. National Semiconductor's

Others blamed pressure from the strong Jupance yem for tak-ing a bite out of the mainframe business just as positive results from last year's acquisition of Fairchild Semiconductor Corp. were building up. can't seems of semiconature way," anid Andrew Kessler, a se-curities analyst at Paine Webber, Inc. "In the semiconductor re-cession, they lost all sorts of

29, National Semiconductor re-ported revenue of 868.2 mil-lion, a 33% increase over the \$51.19 million reported for the same period a year-exifer. Quarterly net income jumped 167% to \$22.4 million, or 18 cents per share, report-ed for the same quarter a year-ago. But analysis had espected examing per share to be more in the neighborhood of 20 to 25 cents.

Revenue for fiscal 1988 was reported at \$2.46 billion, a 32% increase over the \$1.86 billion reported the year before. The

of \$62.7 million, or 48 ce er share, compared with a net se of \$23.4 million, or 36 cents hare, a year earlier. esults for fiscal 1988 inch

Operating periods of the Financial Accounting Standards Board's No. 96 accounting change resulted in an increase in net empige of 82.5 million, or 2 cents per share, in fiscal 1988. Quarterly results were not affected by the change.

Treybig CONTINUED FROM PAGE 67

We're using Unix System V and time unique hardware and adding soft-

ware, he said.

Treybig was mum on details of the new high-end machine, but said it will be air-cooled and will have lower temperatures than current models. He said Tandem could build computers twice as powerful as what is currently offered without add-

g plumbing.

As for some of the company's internal
oblems, Treybig said that they may
re up but are manageable.
Treybig did not comment on rumors of
teover interest by Unisys Corp. last

NEED TO BE sure and concentrate on major problems and not little problems. As you get bigger, you have to work hard to keep things like creativity and innovation."

IAMES G. TREYBIG

oth, but did say "we don't have any in-

month, but did say "we don't have any in-terest in being acquired by anybody."
While Treybig was vacationing in Aru-ba, the company approved a takeover de-fenie measure. It increased its per-share exercise price by 50% and enabled the board of directors to delay the exercise ite, effectively pricing the company out the takeover market, according to TANDEM COMPUTERS, INC.

Montgomery Securities analyst John

Jones.
Jones said the new exercise price "puts
Tandem at a cap of \$12 billion, twice the
current market cap of frumored Unisys
takeover target] NCR Corp., and NCR
generates revenues of about five times
what Tandem generates. The dowry is

#### OFFICE AUTOMATION & DATA SECURITY





#### Emc2% THE TOTALLY AUTOMATED OFFICE

AND ELECTRONIC MAIL

EMC2" FOR THE MAINFRAME AND PC.

nars feature Emc<sup>2</sup>, the le Inces seminars feeture Emc<sup>2</sup>, the leading of office sufmention and slectronic muchs for all BM maintrame and PC environic to the seminary of the seminary of

In addition, the Emc<sup>2</sup> PC Wo mily will sise be presented. oduced to Fischer Internation Emc<sup>2</sup> PC Link, Advanced uninations. d. Atte

# **PC Data Security**

#### MAILSAFE" COMMUNICATIONS SECURITY

AND DATA SECURITY

These seminars will present new data and ommunications security products for PCs and relativement. The products include: Watchdog PC ats Security Version 5.0, the most sophisticated as security system for PCs, Watchdog Armor, the watch on hardware option for Watchdog PC Data courby: RSA/MellSafe for the PC; and RSA/3270 courby: RSA/MellSafe for the PC; and RSA/3270

Wetchdog is the world's most widely used urily system in government and at large and ill businesses. Examine such powerful and so-dicated features as: sutomatic data encryption is transparent to users; multiple user p levsis; ID and password access contri

8 am - 12 anna | 41

8 s.m. - 12 noon

8 s.m. - 12 noon | De

lional Systems Corporation will host this summer seminar series in selected major cities in the United States and Canade. These seminars have been prepared for MIS and DP managers to Los Angeles

explore in depth the benefits and copabilities

computer software systems plans to attend the seminar of the summer to be held In July in a city near you.

**FISCHER** 

RESERVE YOUR SPACE TODAY! CALL TOLL-FREE: 800-237-4510 to make your reservation.

The seminar schedule is as folio

7.20.00

7.91.88

7-25-88

New York

Chicago

#### USTRY, WEEK

#### IBM Europe chief defends strategy

#### BY AMIEL KORNEL

PARIS — Seeking to deflect criticism that IBM's activities in applications software development and systems integration rope that continue to "suffo- France, warned p cate" economic vitality. He apepresent pernicious competi-ion for software and services irms, IBM Europe's top execu-ive praised the firm's Business

tive praised the firm's Bosiness Purtners program at a confer-ence here last month.

C. Michael Armstrong, presi-dent and directour general of IBM Europe, said the program has resulted in partnerships with 2,400 agent companies through-our Europe, the Middle East and Africa dealing with the Sys-tem/8 and 38 and 9370, and with 2,000 IBM Personal Com-puter dealers in Europe.

th 2,000 IBM Persons con-iter dealers in Europe.

Addressing the Sixth World imputing Services Industry ongress, Armstrong defended

the company's growing applica-tions development effort.
"There is much more demand than any of us can satisfy," he said. "It's a market of specializa-tion that no one firm will accom-

To support his argument, Armstrong cited figures indicatng that no single supplier has more than 5% of the European ications software and ser-s markets, both of which are wing more than 20% annual-

etting a site metrong also argued that al-pugh IBM provides its own ap-cations software and services its System/36 and 38 midge family, computer services spanies continue to supply ut 80% of the software and

vices for that market.

Internally, IBM has poured
are than 600 people into its rently created systems integraa activites in Europe, and re than 800 others work in duct development centers ting applications software to et specific client needs. M's push into systems inte-

es in Europe. It readily partnerships with local mies that can offer specific

Changes afect
"There is a will to adapt to the
new rules of the game," said
Jean-Pierre Coffinet, a researcher at the Paris office of management consultants Boot, Allen &
Hamilton, Inc. "The business of M is going to change in coming ars as it sells more complex stems with terminals of all

Other presentations at the agress treated such subject growth in demand for value

strictions.
Anthony Craig, preside General Electric Co.'s Info tion Systems unit, denounced protectionist regulations and commercial restrictions in Eu-

et by 1992. In the conference's keynote sech, Valery Giscard d'Es-ng, former president of nnce, warned participants to more for the common of E-

rope's economic frontiers.
"You and the managers you assist will have to take into account a new European market from 1992 on," Giscard d'Esg said. "In your business, it is notial for you to teach your omers how to adapt to this ket, which is at one and the e time more hom

ham, president of mounts View, Calif.-based market r

spectrum rapor, European spens, or go in information services will grow to \$75.9 billion by 1992 from \$31 billion in 1987. The U.S. market, he predicted, will grow to \$142.4 billion from \$365.5 billion in 1987.

Jimmy de Monteigne, a reporter with Le Monde Informatique, contributed to this report.

#### Is your printer tying up your computer?

Because an extraordinary number of data centers still output to impact printers, the latest data processing technologies are often lashed to 25-year old printer technologies. As a result, your data center may be suffering from a lack of productivity, low print quality and other production inefficiencies.

All would be different if you had a state-of-the-art Xerox 4050 or 4075 Intelligent Printing System. Xerox printing intelligence is resident on the printer, so while your Xerox electronic printer prints at maximum throughput speed, your mainframe meets the

payroll or compiles annual report data. You're using the same cut-sheet paper everybody in the office uses. Preprinted stock is a thing of the past because the

forms, logos and signatures that made it a costly necessity are stored electronically in your printing system, available for use or change at any time And best of all, your documents will have up to 300 × 300 spi resolution instead of third generation carbon

Set your mainframe computer free. Xerox has pioneered the conversion of thousands of data centers to electronic printing and has specific applications developed, proven and ready to put in place today.

Xerox Intelligent Printing Systems are products in support of Xerox leadership in document processing. Whether creating, copying, distributing or filing.

we turn ideas and information into electronic and hard copy document are superior in look and content.

For specific information about Xerox lendful Pressing Systems and how they can meet you data center's unique applications requirement cell us at 1-800-TEAM-XEX (1-800-832-69)

ext. 192 D, or send the cou eros Corporation, PO Box 24, Rochester, NY 14692

XT2 27 001307-11-00



#### Zachmann

CONTINUED FROM PAGE 67

range systems to small and medium-size' companies. But I can't, for the life of me, see why it should mean that IBM is going to do any better in the near term.

Leaks flooded market In the first place, Silverlake (er, I mean the AS/400) had been so thoroughly leaked and therefore anticipated by everybody that it is hard to see why the actual rollout should change anything at all. IBM's customers — and competito - have known for some time what was

d, even if we don't quibble with

IBM's own somewhat esoteric benchmarks, a 30% improvement in price/per-formance hardly creates a radically differ-ent competitive environment. It is no more than par for the course as far as new M proprietary architecture systems

IBM proprietary architecture systems go, it doesn't even pose a major competi-tive threat to traditional higher priced minicomputer vendors like DEC, let alone more aggressively priced micro-based systems from vendors like Sequent. Third, the AS/400 announcement ef-fectively confirms what has already been fectively confirms what has already been apparent for some time to those who cared to look: BBM has just about com-pletely abandoned its early efforts to create a thrue-tier system strategy for large organizations. The AS/400 is miles away from being an effective departmen-

Lotus

tal processor for large organizations. It remains true to its roots in the System/36 and 38 line as a primary system for small and one-disan-size businesses.

All of which means that the resility behind IBM's Systems Application Architecture (SAA) supposedly unifying the Personal System/2, System/36 and 38, 370, 3090 and 9370 architectures is quite different from its superfical appearance of the system of

ance.

SAA doesn't represent the unification of three architectures into a threetier processor strategy at all. Instead, it
adds up to a two-tier strategy in which the
top tier, in large organisations, is meant
to be the 3090 and, in medium-size and
"Ill commissions the AS/400." all organizations, the AS/400. IBM's response to DEC's pen

into departments of larger organisations with VAX VMS systems, in other words, is simply to convince users to treat FS/2s as, in effect, "super-smart" terminals connected to 3090 host systems running IBM's MVS/ESA. IBM is following what

Spend more, get less.
The result is system that is much to expenditure and the colony to be taken properties and for the change to be taken properties.

The result is a system that it is a considerable to traditional vanders — like the NCR Tower or to the Prinze ELS 16— the AS/200 et al. (1) and the colony of the colony of

andre anteriors of the control of th

Zachment is vice-president of research at In-tional Data Corp.

# 1-2-Freebies Lotus 1-2-3 -

The Lotus' Value Pack " with valuable free extras. Only \$279, with your choice of popular add-ins for just \$5 extra. More than six million users have made

More than sox million users have made Lotus 1-2-37 the backbone of American business. It's far and away the most used and most useful software on the market today. And right now, when you buy 1-2-3 from Software Sportrum, we'll throw in several valuable extras, at no

ht's called the Lotus Value Pack, and it lets you remove the copy protection from 1-2-3 to make it easy to transfer to your hard disk. Then there's Lotus Speed-Up", which gives 1-2-3 the

76

fastest recalculation available. And Lotus Leam\*\*, which makes customizing spreadsheets and creating macros a snap. There's even an 800-number,

ing marcos a snap. There's even an 800-number, to give you six morths of the best amount support to give you six morths of the best amount support and the state of sta

SOFTWARE SPECTRUM

10420 Miller Road, Dallas, Texas 75238 214/349-0400 "In Illinois, Indiana, Michigan and Wisconsin call 1-800-445-6454 Later and L.D.S are resistant and

amounts to a regressive circle-the-wag ons-round-the-mainframe strategy, re-turning the AS/400 to the small-busine roots of the original System/3 of the ea

#### Cherney CONTINUED FROM PAGE 67

CON Increase Transcription of Syracuse, N.Y..

The combination of Syracuse, N.Y..

The combination of Syracuse, N.Y..

Inseed CIS and CAI flamegred the independent leasing industry's No. 2 and No. 3 and No.

pred supporter erner, who led the lawait to block the S takeover but was defeated, was pro-sited from competing spainst CMI until y 31 of this year. But lessing industry servers considered him the snoral sup-ret of Encore international, whose anagement team, location and name

noid one.

In a prepared statement inmerney used, "I have evaluated a number
opportunities and decided to stay in
confided Hills and join Excerc.
With Cherney's arrival, Marks asmund the No. 2 position at Exactor intermed the No. 2 position at Exactor interindex operating officer and exinterna-

sent an came operandent. Encore Inter al Encotive Vice-Presidents Fr riter and Gary Smith and Chief Pa Officer Dennis Grice, all former (

# Clear, well-defined vision is the mark of a leader.

The Wyse WY-60. If there's one reason why Wyse is today the world's leading independent terminal manufacturer, it's vision. From the beginning, Wyse designers have had the uncanny knack of seeing what people needed in a terminal-often before they did. That vision is most eloquently articulated in the WY-60.

It's a better ASCII terminal. And ab the better ANSI terminal. And a better PC terminal And a better PC terminal in fact, the WY-60 is compatible with a wide range of operating environments that includes MSDOS, UNIX, KENIX, and PICK. It emulates 20 different personal-ties. With five keyboard options, so nobody has to learn a new one. It's also part of systemifiese: The WY-60 links effortiessly with Wisse PCs and multi-user platforms to create uniquely integrated and cost effective system Southous.

But what people want to see most in a terminal is *clearly*. So the WY-60 has sharp 10x16 characters for extraordinary resolution. A large 132 column x44 line format that can display an entire spreadsheet. And a choice of white, amber or green screen phosphors.

Because we know what vision is most important to people who use a terminal day in and day out. Theirs. Call for more information.

1-800-GET-WYSE

WYSE

We make it better, or we just don't make it.

WYSE\* as a registered implement of Water Technology System/Figure and WY40 as interested by the Inchessing Collect technologies and STATES, SEC. 1970. Managed UNIXE / Assertates Telephone & Telephone PCO, Park Content. Bill: 1987 U.S. Street

#### VM market CONTINUED FROM PAGE 67

Systems Application Architecture, the premotion of the 1920, the inclusion and ref MATA.— all these things that MYS users take for greated are sown coming to WI and advantaged the international control of the inclusion of the inclu

eing that VM is undergoing

a shift from Dangerfield to greener field rket analysts were not in accord as to whether a trend toward con-

Presed setters:
"I definitely see trends both toward considiation and toward expansion," said Timothy McCollum, an analyst at Dean Witter Reynolds, Inc. "MIS managers are more comfortable buying from larger companies, and the companies themselves are well aware of that. It 's hard to get market presence when you're small. get market presence when you're mmall."
McCollum said he expects to see dedicated VM companies either banding together, as have VM Systems and Kolmar,
or dropping the "dedicated" term, as ded
market leader VM Software. VM Soft-

ware recently acquired a networking soft-ware subsidiary, Systems Center, Inc. (CW, May 30), and is rumored to be con-templating an appropriate buy into be Digital Equipment Corp. software mar-

ket. On the other hand, "the software industry as a whole is periodically subject to consolidation," noted Kenneth Burke, as analyst at Alex Brown & Soos, Inc. in Burker. The dynamics of the VM measurest." The dynamics of the VM measurest. "The dynamics of the VM measurest." The dynamics of the VM measurest. The dynamics of the VM measurest. The dynamics of the VM measurest. The visuality of the VM measurest of success, so far, of the IBM and the VM is clearly important of the VM measurest of the VM is clearly important to IBM.

VM Systems will fold Kolinar's re-spected line of end user-oriented VM soft-

ware into VM Systems' VM utilities a distribute both through VM System

companies 'perts," said Mellada Varina, a systems programmer at Prinction Uni-versity, which runs five VM systems, "We were really pleased to hear about it; the combination should prove to be a ma-jor force in the market/place." VM Systems, which acquired several key Kolinar executives, including Presi-dent Jim Bergsten, certainly intends that

to be the Case. "Right now, the VM market tends to be VM Software and Everybody Else," VM Systems' Mancinelli said. "By virtue of (the Kolinar acquisition), we come out the undisputed, undebatable No. 2."

NICKELS & DIMES

Measurex Corp. amounced net income for the second quarter ended May 29 of 8.9 million, or 47 cents per share, compared with net income of \$6 million, or 31 cents per share, reported in the like period a year ago, Revenue for the quarter was \$65.8 million, compared with \$57.6 million, compared with \$57.6 million reported last year.

The Ultimate Corp., amounced revenue for the pare ended Jupil 30 of \$500.2, million, compared this \$1711. million of \$150.0, million, compared this \$1711. million of \$1.000.0, or \$11.30 per there, compared with \$13.00 million, or \$14.50 per there, in the \$13.00 million, or \$14.50 per there, in the \$13.00 million, or \$14.50 per there, in the \$15.00 million, compared with \$50.7 million in the previous pare. Net income for the fincal 1985 fourth quarter was approximately \$10.000. Net income for the promised \$10.000. Net income for the fincal this promised \$10.000. Net income for the final final

Floating Point Systems, Inc. announced revenue for the second quarter ended April 30 of \$17.7 million, compared with " '9.2 million in the previous year. The or \_\_sam reported a net loss of \$7.3 million, or \$2 cents per share, compared with a net loss of \$5.7 million, or 65 cents.

Micron Technology, Inc. announced revenue for the third quarter ended June 2 of \$85.6 million and net income of \$29.3 million, or \$1.01 per share, compared with revenue of \$22.8 million, and a net lose of \$3.7 million, or 14 cents per share, for the third quarter hast year.

Adobe Systems. Inc. announced revenue for the second quarter ended May 31 of \$18.8 million, changared with \$3.6 million last year. Addbe reported profits of \$4.5 million, or 42 cents per share, compared with \$2.3 million, or 22 cents per share, ayear ago.

American Software, Inc. reported revenue for the year ended April 30 of \$54.2 million, compared with \$46.7 mil-lion last year. Profits were \$10.3 million, or \$1 per share, compared with \$8.8 million, or 85 cents per share, in the like peri

ion, or 60 cmas por day of 60 cmas of 40 cm



# LEAVE DEVELOPMENT TROUBLES BEHIND

With Realia's development tools, you can build efficient mainframe applications right on your PC. Every stage of development gets easier, whether you're maintaining an existing application or creating a new one. · Realia COBOL, the fastest PC COBOL compiler, produces the most efficient

executable programs REALCICS® lets you develop and run mainframe CICS programs on the PC.

· RealDBUG offers interactive, source-level debugging better than any mainframe tool. Choose Realia, and your applications backing can soon be just a memory.

#### DEATIA'

10 South Riverside Plaza, Chicago, IL 60606 • (312) 346-0642 • Talex 332979

# **How KBMS solves** a new class of applications.



Until now, mainframe computers have been primarily used for solving the clearly defined, highly proce-dural tasks in your

company such as inventory, payroll,

company such as inventory, payroli, accounting and the like. Why? Because that's the nature of programming languages they use. They must process data according to a rigid structure, in a strict sequence.

But what about the applications in your company that aren't rigidly structured? Such as credit authorization, order configustructured 7 Such as creent aumortzauxu, oroer coungo-ration, risk analysis, forecasting. These are the high-level tasks that involve judgement and complex rules. In many ways, they're the most important of all, because they involve strategic decision-making and corporate policy. Now KBMS, the Knowledge Base Management

System, provides a proven way to solve these applications, offering your company a powerful new competitive tool.

#### Knowledge base technology in the IBM environment.

KBMS works differently than traditional programming. It uses proven artificial intelligence principles to define the sequence in which instructions should be executed, all while the application is running. KBMS evaluates

all while the application is running, KBMS evaluates cach situation, applies the appropriate rules, and makes a judgment or recommends an action.

And KBMS does all this within your IBM mainframe environment. It integrates seamlessly with MYSM, MYS and VM operating systems; CICS, TBO, IMSDC and CMS teleprocessing systems; and DSB, SQUIDS and other database management systems.

You can use KBMS all through your company. To build an expert system for reviewing every incoming order for proper configuration. Or to recommend underwriting decisions to guarantee that corporate policy is followed. Or to enforce credit approval guidelines for your

company.

KBMS can help you solve any business problem that is complex, governed by many interrelated rules and policies, or subject to frequent change — in other words, applications that apply judgement to data, rather than just process data.

#### Send for this free Executive Guide.

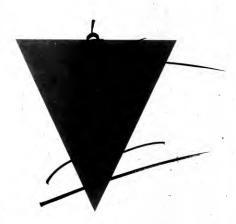
We've prepared a free Executive Guide on the concepts we we prepared a free executive cutace on me concepts and applications of knowledge base systems. If provides a clear, concise overview of the emerging technology and answers the most frequently asked questions about knowledge bases yettern. Al Corp. reader of the INTELLE Eat esystems, yettern, creative of the INTELLE Can tainful language system, is the leader in providing Al-based applications for the IBM maintrane.

For your free guide, please call (617) 890-8400. Or write AlCorp, 100 Fifth Avenue, Waltham, MA 02254-9156.

Bringing AI Software to Bu

The only practical knowledge base management system for your IBM mainframe environment.

Service in a whole new light.



ALCATEL CORTELCO\* Second Largest U.S. Manufacturer of Telephones and Key Systems

ALCATEL COURSER 3270-Compatible Controllers and Displays

\*Formerly Apparatus Division of ITT Telecommunications

FRIDEN ALCATEL Innovative Supplier of Postoge Meters, Morting and

# ALCATEL IS SERVICE

Actually, Alcatel is a synergy of leading information processing and communications companies working together to offer you the systems and services your business needs to compete, prosper and grow.

Such companies as Alcatel SERVCOM. For nearly 20 years, SERVCOM has maintained and serviced over 400 types of data processing and communications equipment—from PCs to PABXs to mainframes.

manurames.

And Alcatel SERVCOM does everything from on-site service and depot repair to installation, relocation and whole unit refurbishment.

In fact, SERVCOM's reputation for quality service—customized to the way your company does business—has established SERVCOM as one of the leading independent service organizations in North America.

North America.

Now as part of \$13 billion Alcatel,
SERVCOM shares the technical, financial
and professional resources to serve you
and your business better than ever.

So take a close look at the comprehensive solutions Alcatel has to offer. When you do, you'll see what we mean by "Service in a whole new light."



For more information on the Alcatel companies, call 1-800-556-1234 (ext. 247) or in California 1-800-441-2345 (ext. 247); or write Alcatel Business Systems, 1623 Buckeye Drive, Milpitas, CA 95035.

LCATEL PABX SYSTEMS\* Supplier of Advanced mall and Medium Size PABX and Key Systems ALCATEL SERVCOM
Computer Maintenance and

ALCATEL
XTRA BUSINESS SYSTEMS
High Performance Single and
Multiples Committee

\*\*Formerly ITT Business Communications Corporation and Thomson CSF Operation

# "Our ads in Computerworld had the resumes pouring in and the phones ringing."

- Linda Huebsche Manager of Employmen

With more than 60,000 customers worldwide, Unisys is a \$10 billion information systems company that applies leading-edge technology to provide the best possible solutions to its customers.

So naturally, says Linda Huebscher, Manager of Employment for the company's Product & Technology Operations division in Roseville, Minnesota, Unisys wants the best technically trained personnel on its team. And for the most successful recruitment of such qualified professionals, Linda explains, Unisys turns to Computer-

"We recently embarked on two major recruitment campaigns for systems programmers. First, we need to support our development of Unix-related products and services. Second, we seek systems programmers to bely us capitalize on our lead in fourth generation language (4GL) technology

"We want programmers who are well qualified, aggressive and systems motivated. The market for programmers with Unix kernel and shell development experience is extremely competitive. Just as it is for professionals with backgrounds in C programming, relational database and 1100 systems technology.

"And we are confident we'll find these professionals through Computerworld. I asked our key systems programmers and managers which periodicals are most widely read by our top programmers. I was told in no uncertain terms that Computerworld is at the top of their reading lists.

"That became clear when we saw the results. Our ads in Computerworld had the resumes pouring in and the phones ringing. We averaged 28 responses for each ad the ran. But most importantly, we made several very good bires."

Computerworld. We're helping serious employers and top computer professionals get together every week. Just ask Linda Huebscher.

For all the facts on how Computerworld can put you in touch with qualified personnel, call your local Computerworld Recruitment Advertising Sales Representative today.

\* Unix is a regimered undersark of AT&T Bell Laboratories.



#### COMPUTERWORLD

The weekly newspaper of record for computer professionals.

375 Cochituste Road, Box 9171, Framingham, MA 01701-9171, 800-343-6474 (in MA call 508-879-0700)

An IDG Communications Newspaper



It's every Honday morning ... Get the competitive edge on the week ahead !

YES, I want to be the first to know! Please send me 51 weekly issues of COMPUTERWORLD for only \$44.00 — just 865 per copy. In addition, I'll receive FREE bonus issues of COMPUTERWORLD FOCUS!

Address shown: ☐ Home ☐ Business

For faster service call 1-800-255-6286! Canada Crossal America & South America 1110/Suarge 1165 All other countries \$245 (Atmist) Foreign orders mass be prepaid in U.S. dollars

Please complete the information to the right to qualify for this special rate

### COMPUTERWORLD

It's every Honday morning. Get the competitive edge on the week ahead !

YES, I want to be the first to know! Please send me 51 weekly issues of COMPUTERWORLD for only \$44.00 — just 865 per copy. In addition, I'll receive FREE bonus issues of COMPUTERWORLD FOCUS:

The Let mee

For faster service call 1-800-255-6286!

Canada Central America & South America \$110/Europe \$165. All other countries \$245 (Armall) forcign orders must be prepaid in U.S. dellars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD



MANUFACTOR one one whose the tree conjust; restrictions and the

di Commontanti Simini Anti Cimus

a barrigiori anti Anti Cimus anti Company

di Santa Anti Commontanti Company

di Santa Anti Commontanti Company

di Santa Anti Commontanti Commontanti Commontanti

di Santa Commontanti Commontanti Commontanti

di Santa Commontanti Commo

COMPATIBLE SERVICES SERVICES OF THE SERVICES O



POSTAGE WILL BE PAID BY ADDRESSEE

P.O. Box 2008

PUBLISHING SERVICE CENTER Knoxville, Iowa 50198-2008

bbbllamallidadadaddliadlaaddadd



NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

**BUSINESS REPLY MAIL** FIRST CLASS PERMIT NO 55 KNOXVILLE, IA 50198-2008

POSTAGE WILL BE PAID BY ADDRESSEE

PUBLISHING SERVICE CENTER P.O. Box 2008 Knoxville, Iowa 50198-2008

للبواران الوبالليان المامان الماسان المامانا

# COMPUTER CAREERS

# Contingency planners in demand

Diplomacy, even evangelism, sought in disaster recovery specialists



earthquakes in the past several years — and the busicatastro

es — have planted contingen-planning positions firmly on cy painting positions firmly on the map in many corporations. The natural disasters have underscored the dependence of corporations on their data cen-ters. In addition to firms legally required to have contingency

ians, others are grasping the ct that they cannot survive ithout backup facilities. Cameron Carey, president of Computer Security Placement Corp. in Northboro, Mass., says be saw little concern and few optunities in the area until two irs ago. Since then, however,

tingency planning has often a part-time responsibility, been a pur-time responsumary, with data security a frequent companion. But in many places, it is becoming a full-time occupa-tion. "Companies are realizing that there is a lot to disaster recovery and that it is not a part-time job," says Jack Bannan, an

information security manager at General Electric Co. and presi-dent of the Delaware Valley Di-saster Recovery Information Ex-are seasoned For the most part, those m ing into contingency planning are seasoned DP professionals with wide experience. Most learned something about contin-According to Carey, salaries for lower level positions, such as a contingency planning analyst,

HE CONTINGENCY PLANNER has to be less a technician and more a "human communicator and diplomat who is able to sell the program and think his or her way through corporate policies."

> CAMERON CAREY COMPUTER SECURITY PLACEMENT CORP.

> > those in contingency planning do not have to know programming but that the tacketcal locality

but that the securicia nature co-will help former programmers. When Carey acouts for a pro-spective candidate, he looks for interpersonal skills and strong written and verbal communica-

average about \$38,000 in the Northeast. For contingency planners sularies average shout \$48,000, he says. The pay scale for the top position of information integrity officer varies wide. Carry says the salary at a brain would average \$60,000, while it might be vince that at a Wall Street brokerage firm. Because of information of orderal regulations, there are more contingency planning opportunities where financial institutions and government contractors, Carry says. more than 25 years, says the contigency planner does not need "a machine-specific back-ground." Disaster recovery, he says, "is more general, involving a lot of common sense that is transparent to the system." But Bannan emphasizes that But Bannan emphasizes that technical knowledge of the data center is essential. He adds that

ancial institutions and govern-nt contractors, Carey says.

tions. These attributes are nec-essary to coordinate the various groups of people involved in con-

groups of people involves in con-tingency planning.

Ultimately, Carcy says, the contingency planner has to be less a technician and more a "bu-man communicator and diplomat who is able to sell the program who is able to sell the program and think his or her way th

corporate policies."

Chuck Pachinger, senior data security analyst at National City Bank in Cleveland, explains that a substantial part of his job in-volves educating top manage-

votres educating top manage-ment about the importance of di-saster recovery. He enjoys the contact with different groups of people, but any, "I can't say it's always rewarding."

Recause of the large number of people involved, there are no speedy results, Pachinger ex-plains. "It is a long, draw-out "It is a long, drawn-out imbersome process." But

Pachinger says he finds it inter-esting to work with groups out-side MIS and satisfying once the

Another contingency pl ner, Judith Hinds at Chem Bank in New York, says she fit this contact with myriad grow one of the most interesting p of her job. Hinds, an assis treasurer in the bank's disa

GE's Bannan says contingen-cy planners must be "absolutely evangelical" about disaster re-covery: "In minny instances, the person will have to convince management and the other peo-ple involved that it is an important function," be says.

en is a Philadelphia-based free-

#### Summertime blues?

job hunting, according to Jack Erdin, president of Manage-ment Dimensions, Inc., a cement and career con-

First, Erdin says, a lot of rirst, Erdan siya, a tot or people view the summer as a bad time to job hunt; further-more, many are vacationing then, so there is less competi-tion. In addition, the following must be considered:

 At numerous companies,
 July 1 ushers in the new fiscal year, br Summer slowdowns pro-vide time to discuss jobs or

portanties for career net-working; in addition, compa-ny outings and sports events can facilitate meeting with

COMPUTER SERVICES MANAGER

Minterescent live of a progressive Minterescent Courty Production Courty Production Courty Production Courty Production Courty Production Courty Production Courty of the Production Public Courty and the Court of Minterescent Courty of the Court of Partic Court of the Production Courty of the Production of the Production Courty of the Production

2001 - Inventor in 201 southers.
Condelline for the posterior many concertainty of the posterior many concertainty southers are stated for a
memory of years of state processing southers residing of a
posterior southers are stated or a
posterior southers of the con
to remark of the control of the con
to remark of the con
to remark of the con
to remark of the con

the control of the con

the control of the con

the control of the con

the con

the control of the con

#### **Business Opportunity** Software Authors

dent Software Author, and if you are an expe in DB2. IMS, CICS, MVS, VTAM, NCP, No view and /or VSE, we would like to h you.
We are interested in capturing your knowledge for use in a new and exciting line of products called ADVISORS.

called-ADVISORS.

Write us at \$10 Oakmoud Parkway, Sunnyvale,
CA 94066 Atta: V. P. Business Development,
and we will respond with information on our
unique Expert System Development Tools and
how you can become BIMORTAL.

Boole & Babbage, Inc. We've got the scoop

uni your next job

Datatho gives you be real screep. Our large
nationating with cleen juries 1970 gives
into give with cleen juries 1970 gives
into give the companies the positions is
next and the departments that you will
look and thousands of hunghwate services
for the cleen of the gives the context of the posi-

#### SYSTEMS PROGRAMMER/ DATA BASE ADMINISTRATOR

METON NOUSTRIE

**Programmers** 

Systems Analysts

#### Operations Supervisors Opportunities at New Fermilab Facility

- --- AMDAHL 5890-600E and a future terabyte file
- AMAINT. Selection and a future serapyse for server system MX CLUSTER (8820s, 8850s, etc.) ACPs parallel processor system (250 MIPS) Detta communications systems including local, wide area and worklevide networking.

Analysis, Dec. and low supervision a ringing operations, of 40 miles west of Chicago, Fermilab specializes in some of set challenging and instrumental projects locing science offer a compressive selleny/benefit peckage along with the chance plat of new wroads in data processing. Qualified michidulais, submit resume and salely healthy, in confidence, to Jumes imports, Fermil National Assistantiar Laleuratury, RVI. Beautesting, Fermil National Assistantiar Laleuratury, RVI. Beautesting, Illinois 80500, An Equal Opportunity Employee MF.





are qualified to answer this ad.

Project Leader

nthrit mechaperturmance dan man programs for our Dans or Banking Systems. Involves among robons crosses usuall on release and supporting on mancy orbits seveled. You is

GIBRALTAR'

Sr. Technical Analyst

#### NATURAL Technical Support

ADABAS Specialist PROGRAMMER ANALYSTS Sentential County FLD has as seministed victory for a Tournace Diagnost Security for a Tournace Diagnost Security for the passion of the Computer Operations area. French, or Operations area for the passion with to be self-in computing specific particular activation of the County of SENIOR ANALYSTS

perienced (3-5 years) in Natural Adabas. Financial and manufacturing bacignostic a plus. O or L clearance helpful, but not required. Must be degreed. Competitive salance and benefits. Call or send res-ume to our Corporate Office today:



# PROGRAMMERS, ANALYSTS, SOFTWARE ENGINEERS

Can A Com REALLY Hire Only The Best?

ONLY The Seal.

They got I. We can't by string the more destinated, parameters Dr. per-feed and commenceus Dr. per-feed and per

DAY DE S

Equal Opportunity Employer MEAN

EAT PLACE

ALC PROGRAMMER

RESEARCH TRIANGLE

**FOX-MORRIS** 

It's new! And it's the efficient way

to recruit qualified computer professionals Now you can target your recruitment advertis to the qualified computer protessionals you w to reach - where you want to reach them. At a need is the new IDG Communications Compu-need is the new IDG Communications Compu-careers Network. Here's how it can work for y

**IULY 11, 1988** 

#### Telecommunications Engineer

The nationally renowned research facility. Form National Accelerator Laboratory, in seeking a versable leader to design, con-text, maintain and monitor all sepects of our extensive telephone system.

As Head of the Communications Group, responsibilities will include working with re-quirements for voco, data, retegnated vocadata and Centres systems. LAN and TI interfaces are other typical applications.

The qualified candidate will possess 5 years experience in digital electromorphisms and cable jober management geterns. Working involvedops of electromorphisms. Working involvedops of electromorphisms and equations and equations and equations as Melatina department as will Excellent communication felia and a Melatina department and equations or the in electromorphism communications or the in electromorphism communications.

equivalent is required. Located 40 miles west of downstown Chicago, Fermitab operation under a con-ment or her UES operations of Energy and miles of the control of the control of the register of the control of the control of register of the control of the control of without the control of the contro



#### PROGRAMMER/ANALYST

Data Processing



#### AREA SALES MANAGERS

Top income and carreer opportunitie professional field sales persons sellir call area networks to O.E.M.'s and tune 1000 end users.

We are an established designer and manufacturer of twisted pair and fiber optic. LNN equipment undergoing a major expension in new product heroduction and sales. A good working introvedage of data communications, microcomputers, LNNs, and willingness to travel is required. Positions in Chicago, Boston, and

We offer an excellent compensation package of base salary, commission, car allowance, medical dental, 401K. Re-sums to: TCL Inc., 47621 Westinghouse Drive, Fremont, CA 94539.

#### Senior Programmer Änalyst

Milwaukee, WI

Conceptualize the Solutions for 2600 Health Care Specialists.

PRCs Milwaukee Medical Data Cent (MDC), employs 50 experts in compu-operations, production control, infor-tion center operations, systems analys-and development.

and development. In addition to regularly interacting with other regional benjutals for information processing and exchange of altonometry analysis information, the MDC opposity analysis information, the MDC opposity analysis information, the MDC opposity analysis information, the MDC opposition and the contract of t

nanity for excellence.
You will enact high-level computer systems analysis and design; organize and perform systems development extinities; and assume responsibility for a staff of applications programmers. Requires extensive experience, creative ingenuity and independent judgement developing novel techniques and new concepts.

Must have 6-8 years' experience in COBOL and CICS command level per gramming in an IBM 30XX, MVS envronment; and capabilities for independent work. IMS database, PCS/ADS hospital applications experience in desirable.

cor sumediate consideration, please send your réturné in confidence to: Planning Research Corporation, Department LL-II, 1500 Planning Research Drive, McLean, VA 22102. An Equal Opportunity Employer M/F/H/V.

**EMHART** PRC

Systems Professionals...

Take A Step

With extensive capabilities built on image processing, artifi-cial intelligence, relational data bases, etc. our legit school-ogy track record speaks for itself. Uslinging the most sub-licated systems and applications programming tools avail-ble, we're maintaining continuals better of the art involve-ment. And, we're not stopping there.

We're taking another step forward with GENESIS. an extensive, multi-year systems development project that well support our servicing trapballities and product innovations for 1890s. In order to achieve this goal, we are seeing creative, self-mobilized Systems Professionals for postions are visional services levels. These challenging opportunities will be located in

Basic qualifications must include a minimum of 2 years experience in design and development of business applica-tion systems. A degree in Complete Science or Business is preferential. Working knowledge of relational data bases is highly desirable. Experience with the following will enhance your candidacy:

Data-driven design methodolog
 High volume, on-line systems
 Automated design tools (CASE)
 Application code generators

If you have a strong drive and commitment to reaching new levels of excellence, we invite you to take this step forward with us by sending your resume with salary requirements to: J. Benjamin, AMERICAN EXPRESS, P.O. Box 53697-CW hoenix, AZ 85072-3897.











PROGRAMMER ANALYSTS Redesion prised PL-L CICS

825-46,000

WAYNE S.MELLO

#### SENIOR SYSTEMS PROGRAMMER

Signs-Aldrich is a St. Louis based corpora tion which has an outstanding growth ratio as a multi-relation instructionary and destrou-ers a multi-relation instructionary and destrou-research community. Our growth law for whiteled expension of our data processing commitment and has created the need processing commitment and has created the need discon-tional schonical talent to utilize state-of-the-art hardware and software in an ISM 3004-0351 CCS environment.

The ideal candidate will have extensive experience using DOS/VSE on large IBM mar frame computers. Additional considerational by given for VSAM, CICS, VM, VTAM, DI and MVS experience.

and MVS experience.
This is an excellent opportunity to succeed is rapidly growing profitable organization. Salely is commensurate with experience. Full paid company benefits.
For further information call or write:



CORPORATION P.O. BOX 14508 SAINT LOUIS, MISSOURI 63178

# "For Source Edp, Computerworld is a people-and profit-puller."



Vice President & Ad Director Source Services Completation Mountain View, CA

avie Grinnell is Vice President and Advertising Director of Source Services Corporation, the parent company of Source Bet, the world's I supper recruiting firm that specializes in the computer profession. Source Etp has been an advertiser in "Computerworld" or dinner than inception of the publication. Here's

"With its laniastic pass-along circulation. Computerworld not only receive executives in computer management, but programmens systems analysis and other individual contributors that are in particular demand by our client firms. It helps us reach the heart of our condicider base efficiently."

Because we're actional in sope, we need the count-to-occut coverage annual to the complete medical service and the count-to-occut coverage annual service that complete medical service and the count-to-occut counttered to the count-to-occut service and the count-to-occut service and the Houston to Rochester. NY. . Then Seattle to Missell. . . you name it. That's something that local newspapers. Jocal radio and other media we active use cardi accomplish for us with an unch direct success."

"In short, why do we depend on Computerworld? First, it's profitable reading for employers. Second, it's profitable reading for those seeking new employment. And third, through our services, it also profitable reading for us. It's a "win-win-win" situation for all."

Computerworld. We're helping employers, lop professionals and perpile who help them get allead get together. Every week. Aust all forms For all the state on how Computerworld can put you in touch with qualitied personnel, call your local Computerworld Recruitment Advertising soles representations.

### COMPUTERWORLD

As IDG Communications Publication

# "...The quantity and quality of responses we've gotten from Computer world have been better than those generated by any other form of advertising we've tried."

- Bob Stevenson Presiden

onsulting comes first at CIBER and that's even reflected in their name. CIBER stands for Consultants in Business Engineering and Research, a national company that's been providing top consulting services to the information processing departments of business and government clients since

In order to deliver superior services, the company needs to attract qualified consultants. And from there, CIBER — like any other bustness— needs to market itself to clients. CIBER meets both challenges with Computerworld, says company President Bob Stevenson. \* \( \)

"(TIBER demands the most when it comes to biring consultants, just as clients demand the most from consulting services. In addition to being technically competent, (TIBER consultants should have both a professional attitude and a commitment to our clients.

"To attract this calibre of consulting talent, we go to the same source we use to attract clients — Computerworld.

That's because we know Computerworld is effective. We get national exposure to potential client companies, and we recruit highly qualified professionals for our consulting positions.

"In both instances, the quantity and quality of responses we've gotten from Computerworld have been better than those generated by any other form of advertising we've tried. We've definite-

ly seeing a bigb return on our investment with Computerworld.

"The bottom line is that Computerworld works well for us. So we'll continue to rely on Computerworld as an important — and effective — part

of our future."

Computerworld. We're helping serious employers and top computer professionals get together. Every week. Just 2sk

Bob Stevenson.

For all the facts on how Computerworld can put you in touch with qualified personnel,
call your local Computerworld Recruitment Advertising



#### COMPUTERWORLD

The weekly newspaper of record for computer professionals

575 Cochitoate Road, Box 9171, Framingham, MA 01701-9171, (800) 343-6474 (in MA call (617) 879-0700)
As IDG Communications Publicance

Sales Representative today.

#### **QATAR GENERAL PETROLEUM** CORPORATION (STATE OF GATAR)

opportunities in the Middle East for Computer Professionals

C is the National Corporation covering the exploration, producting and marketing of Catar's oil and gas resources. We are quarters function of GGRC, situated in Doha, where many empiritually enjoy challenging work opportunities in a modern urban mant. We offer a good family life style, with generous compositions.

vise, monitor and participate in the installation, implementation terms of IBM Operating Systems running in IBM 4381/4341 terms. Applicants should hold suitable professional qualifications in had at least 8 years relevant data processing experience. A throwledge of VMICMS, VSESP, SNAVTAM, CICSVS etc. Is

To supervise a group of specialists in our Information and Computer Services Department supporting. End Users Computers' based on 8M micros Broughout the Composition, Applicarts should be professionally qualified with at least 8 years retrieval computing experience to include micro computer fuerfuers and software support and develop-mental and a service of the service of the service of the service of the MCRUSTAR and FOCUS continues a required.

nalyst Programmers - Commercial & Technical develop and maintain systems on IBM maintaine computers. Appli-tis must be professional qualified and have at least 5 years retevant periods in the oil industry of administrative or technical systems with propriets detailed knowledge of EdM ASH1/481 systems operating in MMCUS, VSESS SMAVTAM, CICSIVS, COBOL, FOCIAS, FOR-AN, DLY VSAM etc.

- and stating tear-free in warms:

  e married accommendation and unitides,

  working days leave, per year with naturn air sickets to bese
  married accommendation and unitides;

  expressed and the properties of the stating of the stating

# THE RECRUITMENT COORDINATOR QATAR GENERAL PETROLEUM CORPORATION

P.O. BOX 3212 DOHA-QATAR



The Experts



#### Unlock your potential.

If your present data processing position isn't me your expectations, you should turn to ROMAC\*. Your key to success can be a simple phone call to us. Our record of results is due to our unique and uncompromising personal and professional approach,

#### Meet with Success.

Dany, NY	Delhes, TX 214-729-0050	Minnespelle, MN 612-334-9990	St. Leek, HO
Alberta, GA	Darries, Oll	Orlando FL	314-231-4334
MIDRIE, CA			San Diogo,CA
	513-461-1375	407-843-0765	619-231-9659
Raia Cynwyd, PA	Detroit, MI	Persone, NJ	San Francisco, C
15-667-7351	313-567-2000	201-599-0522	
France, MA	Pt. Lauderdale, FL.	Philadelphia, PA	Seettle, WA
17-09-000	305-929-0611	215.568.6810	206-646-6640
Bulliolo, NY	Harders CT	Persond, ME	Steeders, CT
16-853-6203	203-525-8037	207-773-4749	205-358-8155
Chartotie, NC	Houston, TX	Pertuneuth, NIE	Tamon, FL.
04-333-3166	713-227-7700	603-431-2706	\$15,220,5575
Merge, II.	Jacksonville, FL.	Providence, RI	Washington, DC
12-263-0902	904.15E.636E	401-421-2210	202-775-9055
Serviced, Ott	Manchager, XII	Refelat, NC	Wates PA
16-771-6422	600-647-0200	909-878-4454	215,687,6102
chember, OH	Managhia, TM	Bishmond, VA	Wellester Ilife, !
44-221-7077	500,485,8500	904-644-5196	617,239,0000



#### MANAGEMENT INFORMATION SYSTEMS

MANAGER OF TECHNICAL SUPPORT

MICRO COMPUTER/PC DEVELOPMENT

Now... you can recruit the right people in the right places at the right price.

With the new IDG Communications Computer Careers Network, you can run the most tar-geted and cost-ef-ficient recruitment program possible. You simply choose the combination of

For all the facts on putting the Com-puter Careers Net-work to work for you - regionally or nationally - call the seles office nearsales office near-est you. Or con-tact John Corri-gan, Recruitment Advertising Sales Director, at 617-879-0700.

201-987-1350; Jai Novack, 800-343 8474. MABHAGTON D.C.: Kalle Kress, 703 873-4115; Paulin Smith, 800-843-8474 CHICAGO: Patriol Powers, 312-827 4433; Ellen Cesey 800-343-8474, LDS 800-343-8474, LDS 0184; Chris Glenn 800-343-8474, Berbar Wurphy, 714-250 0184; Chris Glenn 800-343-8474, Berbar PRANCEGO: Barbar

CONSULTANTS Advanced Programming Research tons, No. 4 downer, growth-on-ment, computer completing co-sing has computing produce smallest in Change, Columbia, and Country, Chan

stor in any of the following interest.

Pass time software design and of villagement within a for interest passions design and development design and development seeking agreement property property and development populary impagnisms, system seeking, and development (personal payment development, and tool area not useful.)

BHE DECIC ADSO.

HTEAN WITE HATURAL DEAL MEAS AVANT, DOSAVIE, VA VILLULARIUTOWER

1PR

PERMANENT AND/OR CONSULTING **POSITIONS** 

n Spec.-CICS.

OB ERT HA

EDP OPPORTUNITIE

COAST TO COAST

RObort Hell, staffed by EDP professionals for EDP professionals for EDP professionals and the staffed by EDP professional and the staffed by EDP professionals and the staffed by Edec Brownsteen Brown

ROBERT HALF of St. Louis 7733 Fersyth Bird St. Louis, 90 6310 (314 727-1535

 DB2 SYSADM
 MSA
 M&D
 CA
 GENESYS • SI • INCRES • ORACLE • Banking-CA

Donald C. Thomas & Assoc., Inc. 1211 N. Westshore Blv Tarres, Porida 33607

FLORIDA \$20,000 - \$75,000+

COBOL
Tech-Support
MV9/XA
Systems Analy
CICS

TELON
 DB2/SQL

HARTFORD

HARTFORD

DIRECTOR TECH PLANNING

Strong lech, analytical, 5, regnt

Strong lech, analytical, 5, regnt

VTAMWCP, 8, JES 3, Iniphy visible as level oppy. Menage a staff
of sys prog's respon for capacity
plag, per furing 8 DASO mgml.

Excellent growth oppty, full refor.

Excellent growth oppty, tall refor.

TP PROJECT MANAGER
2+ yes mgmt arp + strong bigged
w/VTAM. IBM TP hawtstler's 8-livet leeh appetite in lelecomm
sty (design 8 impl) will quality you
to this accellent s fewel oppty.
Smallent growth potential, but re-

CHARLOTTE

BOSTON

KANSAS CITY

ATA SASE ANALYST
in of 3 yrs logical design,
of data requirements, nor
on of data and design of
all data models. CASE tool
required but a ptys.
Satary to Mid \$40°s

**NEW MEXICO** 

M. Popty. Stan poty. Stan Dick Stermer ROBERT HALF of New Mexico P. O. Bex 3320 naguerque, HM 87 (505) 884-4557 AUSTIN

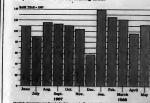
To 8
ROBERT HALF
of Austin
12016 Park 36 Circle
Sulte 301
Austin, TX 78753
(512) 835-0883

WISCONSIN

SOUTHERN CALIFORNIA

DALLAS

#### **CAREER INDEX** Computer recruitment advertising index\*



RECORDANION PROVIDED BY CW PUBLISHING, DIC 9 RECORDINGSYT MARKET BUSINASCH DATA BASE

JULY 11, 1988

CONTROL/ADAMS ADAM ATOMS MAYORAL/ADAMS

#### APPLICATION DEVELOPMENT

Are You One Of The Very Best? Here's your opportunity to work with people of your caliber, and to reap the rewards

of your talent and drive.

At SPL, we have a motto, "Only the very best people are good enoughi". Because our staff is our only asset, we take great pains to identify, attract and keep superb people.

We therefore foster a politics-free environment that is both supportive and lechnically demanding. The minimum standard for the systems that we develop is EXCELLENT, so you will have the opportunity to do high quality work, working together with true professionals, and receive commensurate financial and intellectual revent. SPL specializes is developing applications using 4th generation languages

We require NATURAL / ADABAS experienced staff for our offices in CHICAGO, LOS ANGELES and SAN FRANCISCO. We also need ADSO / IDMS/R experienced staff for our SAN FRANCISCO

In all cases we expect you to demonstrate that you stand head and shoulders above your peers. SO, IF YOU FEEL YOU CAN FLOURISH IN OUR ENVIRONMENT,

MAY BE WHAT YOU'VE BEEN SEARCHING FOR, AND NEVER FOUND



systems programming limited 110 The Embarcadero, San Francisco, CA 94105

#### **Data Processing Opportunities**

We are committed to serving the est

ACP/TPF s programmers with 1+ years exp DB2 SPECIALIST

To install and support DB2 within an OS/MVS/VM environs INFORMATION CENTER CONSULTANT

Evaluate, consult and train on mainframe decision support tools such as DB2, SQL, FOCUS or introcomputer hardware and tware produ

sin individuals in DB2, ACP/DB, MVS, TSO, FOCUS and

COMPILER/LANGUAGE SUPPORT Experience with "C", COBOL and ALC.

DATA SECURITY ort data integrity in an OS/MVS/VM/ACF2 enviror

PARS Data Processing Center is located in Kansas City, Mo., the City of Pountains, ranked high as one of the most livable cities, 18th per capita income and 12th for educational achievement. PARS Service offers comprehensive benefits including:

 Competitive salaries
 Worldwide travel · Hiring bonus · Professional as

· Company-paid reloc e send your resume to: Robert Watts, Employs



PARS Service Partnership P.O. Box 20007 Kansas City, Mo. 64195 No Agencies, Please.

Equal Opportunity to

Svevey/Ivellan smoi/osev svevey/Ivel

#### S/38 PROGRAMMERS (IBM AS400)

We are one of the first companies in the nation to use the IBM AS-80 and you can become a part of our exciting pilot program. We require a minimum of 2 years RPGttf. CLP programming and S-38 experience with exposure to structured design methodology, APPC, and DDM, X, 25

terecommonications is a puss. In addition to working with state-of-the-art technology, System One offers a competitive salary technology, System One offers a competitive salary and comprehensive benefits pus large that metades and comprehensive benefits push large through the salary fitted of the salar

#### System Developers

In-vising remains from individuals in the more highly included computer related visuation. South as: FIG. Computer related visuation when he is FIG. Computer related visuation when he is FIG. Computer Schmidtin, Open Data Base Developers, Architecture, Neiwenske, Data Base Developers, Microsoft, California, Artificial Intelligence, sec. Including date acquaistion, military, percent centeral, CADCAM, secretific application including date acquaistion, military, percent centeral, CADCAM, secretific propriate and propriate control of the computer of the co

re paid by the employer. All geographs on. Send resume or call and ask for our essme Workbook & Career Planaer. fic Placement, Inc., P.O. BOX 19909 m. TX 77224, (713)496-6100

Scientific Placement, Inc

SOFTWARE/HARD **Multiply Your Opportunities** S 볈

Ε S

RSVP SERVICES -computer/net

-

es - \$15 m

FLORIDA

#### COMPUTER CAREERS NETWORK











#### Systems Analysts/ Programmers

ys, a \$10 billion Fortune 50 leader in the informatic ensuring industry, is one of the Washington, D.C. are st and most respected employers.

The American Company of the Company

Cultimer & Installation Support
Problem Souther Techniques
Customer Telephone Support
Customer Telephone Support
(Alternate, O.C. Cheyland, Oilt New York, City, NY, Se
WA, Weshington, D.C. and others
We ofter an outstanding compensation and benefits p
at we's as sport/Cust professional grown opportunities
and the supportunities of the supportunities
confidered area. So opportunities beginning the supportunities
Compression, Federal Information Systems, Afric, Jan. Li
Y entrologies.

### UNISYS

ARABIAN AMERICAN OIL COMPANY

Arabian American OB Company continues the high standards industry leader. We are seeking highly qualified professionals to us in Sandi Arabia.

e an upstream computer analyst in any of the following nd possess a related BS degree along with 5+ years' ex-t. you should consider ...

G EXPLORATION APPLICATION

tly have the following positions available at rate Hondquarters located in Research Triangle

#### SENIOR OFFICE AUTOMATION ANALYST

This position, within our MS Department, will be responsible for providing size iresting and sector consultation for growed large and sector consultation for egifice automation benchment on IEM PCs and DEC montplement, performing one analysis for the implementation of Office Asserts benchment and officers rystems, and providing safetiments publishing applications.

#### SENIOR OFFICE AUTOMATION ANALYST

#### PROGRAMMER ANALYST I





#### COMPUTER CAREERS NETWORK

Now you can reach the qualified computer professionals you're looking for with Computer Careers Network.

TODAY OR ANYTIME

RECRUITMENT ENHANCEMENT SERVICES, INC.

Every week, the new IDG Communications Computer Careers Network of eight leading computer and communications newspapers delivers your recruitment advertising to an audience of highyqualified computer and communications professionals. When you put the proven, weekly authority of Computerworld and specialized readerships of InfoWorld, Network World, Digital
News, Federal Computer Week, and three regional editions of Computer Currents to work for
you, you get the best chance ever to target the qualified professionals you need to read.

solect the publications you need to reach the talent you're looking for. Then target your audience by region. Or blanket the entire nation.

To put the Computer Careers Network to work for you, call the sales office nearest you today.

Sales Offices: John Corrigan, Recruitment Advertising Sales Director, 617-879-0700; BOSTON: Al DeMille or Nancy Percival, (800) 343-6474 (in Mass. 617-879-0700), 375 Cochi-

tuate Road, Framingham, MA 01701.

NEW YORK: Warren Kolber, (201) 967-1350, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652; Jay Novack, 375 Cochituate Road, Framingham, MA 01701, (800) 343-6474.

WASHINGTON, D.C.: Katie Kress, (703) 573-4115, 3022 Jayler Road, Ste. 210. Fairfax. VA

WASHINGTON, D.C.: Rate Kress, (703) '973-4115, '9022' Javier Hoad, Ste. 210, Farfax, VA 22031; Pauline Smith, 375 Cochituate Road, Franringham, MA 01701, (800) 343-6474. CHICAGO: Patricia Powers, (312) 827-4433, 10400 West Higgins Road, Suite 300, Rosemont,

IL 60018; Ellen Casey, 375 Cochituate Road, Framingham, MA 01701, (800) 343-6474.

LOS ANGELES: Barbara Murphy, (714) 250-0164, 18004 Sky Park Circle, Suite 100, Irvine, CA 92714; Chris Glenn, 375 Cochituate Road, Framingham, MA 01701, (800) 1343-6474.

SAN FRANCISCO: Barbara Murphy, (714) 250-0164, 18004 Sky Park Circle, Suite 100, Irvine, CA 92714; Chris Glenn, 375 Cochituate Road, Framingham, MA 01701, (800) 343-6474.

sess day, America puts a brand new Epson computer or printer to work. If you'd like to turn your sales expertise and time into money, we have opportunities available in Chicago, Philadelphia, Washington D.C. and other locations throughout the U.S.

#### Sales Representatives

- Epson will provide you with:

  Competitive base salary comm

- Comprehensive ber
   Defined arcritories
- · Strong customer serv
- averg customer service dwertising, technical and sales support At Epson, we'll support you in every way, allowing you to centrate on closing sales. Why? Because our success begins
- concentrate on closing sales. Wey? Because our success begins with your success.

  For our sales representative positions, you'll send:
  2-3 years of nucestal sales experience, preferably in the nicrecomputer industry

  Bechelor's degree in Business Administration, Marteriting or other appropriate discipling.

  Strong knowledge of small computer/printer products fand two step distribution in preferred

- ent communication and sales skills
- Excellent Communications and saces skills.
   To begin turning your time into money, send your resume with salary history to: Epson America, Sec., 28530 Haurthorne Boulevard, Mail Stop. 340, Bept. CW-MT, Terrance, CA 95095, or call Human Resources of (23) 373-9511. Remember. every missely you delay means six sales for someone else. Equal Opportunity Employer: Principals Only.



WHEN YOU'VE GOT AN EPSON. YOU'VE GOT A LOT OF COMPANY.

# Set your sights on new horizons.



in San Diego, which is an well-known for its many pure foresment control as it is from the same of the

covare Test Engineers
sign, develop, integrate and document test
stems for hardware/software systems
only conformance to design requirements
where, conduct test activities

Each position requires the ability to obtain a society clearance and eni-ded advisors, Ada, NORTEAN and C experience in a VAS/VAX convisual Only considerate was most the anisotron requirements are useful to apply Tout card your resume to Concell Dynamics Data Systems Dranco, Wester Cores, Dower 106, OrDIX Considerated Reply Services, 401 West W Steer, Some 150, See Dego CA 92010.

And argund your world again.

#### SYSTEM PROGRAMMERS

EAGLE FOOD CENTERS
ATTHE BILL PIPE
P.O. BOX 6700
DCK ISLAND, E. 61204-6700
EAGLE FOOD CENTERS
STATE OF THE PIPE
POLIT FOOD CENTERS

#### UNIX and "C"

ins Hospital



#### you deserve the best

PNGRES + DR2 + FOCUS + BMS + CRCE + CRACLE + EMS + FRCE + CAD/CAM + DRC/VAX + 197000 + HONETWELL + CORCL If you're a DP protestand with 2+ years experience, contact Anotec for information on positions analogists of our various locations. Call (313) S40-440 or send your seasons.

Analytical Technologies, Inc. 3000 felegraph Boat, Sale 184 Strongham, 56 48010

DATA MANAGEMENT SEARCH, INC. HE PATLANTA, BALLARYT WORTH & KANDAR CITY OF

1-800-367-6430

IULY 11, 1988

### MARKETPLACE

### Cost-conscious firms buy used

Budget constraints up demand; cutbacks in supply enlarge used market

BY DAVID A. LUDLUM

tral processor, a growing sher of firms are said to be ing to buy used equipment in face of corporate cost con-

so at the corporate level have ected the used market tre-endously," says Ray C. Davis, ecutive director of the Nation-

ing to studies by the and Davis says those is understate the growth

conscious led-Signal, Inc.'s Allied surket division, a maker omobile parts in Provi-R.L., the selection of a computer illustrates tradi-

to position its technology behind the leading edge and projects a two-year need for the processor, will install a used IBM 3081 mainframe, according to William , according to William manager of MIS tech-'The biggers'

Parnham, manager of MIS tech-nology. "The biggest reason we're going to put in a 3081 ver-sus a 3090 is price," Farnham explains. "We priced a 3090 Model 180 at about \$1.7 million. The 3061 KX was about \$500,000 a few months ago, and

The 3081 runs at a sp The 3081 runs at a speed of 15 million instructions per second (MIPS) while, according to IBM, a 3090 Model 180E would be only slightly inster at 17.6 MIPS, Farnhum myn.

"And the reliability is there—the boxes have run well," be says of IBM's 3081. "The KXs

ive a good name in the market-ace. They work well for a long

But, "there are two ways to skin a cat," says George Di-Nardo, executive vice-president Nardo, executive vice-pressuem of information management and research at Mellon Bank Corp. in Pittsburgh. DiNardo says that with the double-digit growth of the bank's processing business.

prompt failing organisations to unload equipment, he says. "Banks are finding them-selves in a brokering position. They start dumping them on the used computer dealers at a low cost to the dealers." he says. says, contending the approach has allowed him to cut the cost of users' work 10% a year for 15

cost to the dealers," he says.

But the used computer market also reflects the downward spiral of prices for new hardware. A new ATAET 382, for example, now sells for less than a used one did two years ago, according to Davis. The discontinued 382 300 is still available new

UDGET CUTS within companies at the corporate level have affected the used market tremendously.

"For us, it simply pays to buy the newest," DiNardo says, be-cause of the price/performance ns and "because we're simply fraid to take the latest tech-

new processors oner some more power than their predeces-sors for roughly the same price and support costs, including per-sonnel, according to DiNardo.

One reason the prices of used computers continue to decline in the face of firm demand is a glut uipment on the market, ac ing to the NACD's Davis That demand is due in part to the introduction of products but also

YOUR BEST

NATIONAL ASSOCIATION OF COMPUTER DEALERS When fully depreciated after five for \$3,000, while used units sold years, they might fetch for \$5,000 two years ago and \$500,000, he says.

Sold, two years ago and now go for about \$1,800, he

IBM PC Me

XT Mo AT Me

AT Me AT Me

PS/21 PS/21

rnces of these computers also face downward pressure because the cost of mistaining them can be high, Davis adds. Maintenance might cost \$200 a month for a new Digital Equipment Corp. VAX 1173 but \$600 to \$800 a month for a used VAX

indeed, users and analysts say that for companies that buy used Ludium is a Computerworld ser

probably the largest concern offetting the attractions — the low prices and, in some cases.

aire that the used proc they buy are eligible for m nance by the vendor, acco to Whit Dodson, vice-pres of research at ma firm International

n international Data Corp. I shington, D.C. "That means it had to be in "That means it had to be in-spected by the original equip-ment manufacturer and certi-fied." Dodson says. With the certification, a used processor is generally as reliable as a new one of the same make and model, al-though it would tend to be less reliable than a more recent prod-

, he says. Federal government budget setraints have probably not al-

There's a big bugaboo that ne government inventory is ob-siete," he says, and for a new system, agencies would rarely permit the purchase of a used processor for fear the machine would become obsolete during the typical four- to 12-year life of

a system.

"Where they would be interested is where they have installed equipment and need some more," Dodson says.

**PC Products** 

### PC RENTALS

Weekly . Monthly . Yearly IRM COMPAG

EPSON & PACKARD PRINT

· Ouick Delivery · Maintenance

"Serving the equipment and naintenance needs of business for over 20 years!"

SELECTERM / OWIKTERM New York

(617) 246-1665 (212) 564-7731 Hartford

(203) 242-4699

Washington (703) 522-2509 SOURCE FOR

The BoCoEx Index Closing prices report for the week ending July 1, 1988

EU.	Closing price	Recent	Bacont
del 076	\$750	\$950	\$600
MI 086	\$1,100	\$1,100	\$875
del 089	\$1,450	\$1,650	\$1,150
ial 009	\$2,100	\$2,350	\$1,800
del 230	\$2,600	\$2,750	\$2,125
iel 339	\$3,200	\$3,450	\$2,600
fedel 30	\$1,525	\$1,660	\$800
fodel 50	\$1,275	\$2,375	\$1,900
I oblas	9750	\$800	3575
Indian II	82,278	\$2,375	\$1,850
table III	\$2,950	\$3,000	\$3,700
table 206	\$2,360	\$2,350	\$1,675
	\$1,000	\$1,100	9900
ingro 20-2016	\$1,250	81,450	\$975
ingro 200	\$2,275	82,475	81,800
Apre 200	95,050	\$5,100	\$4,600
steek 512	\$675	\$750	\$575
12E	\$850	\$925	\$450
Thus	\$1.075	\$1.100	\$850

#### **Used Equipment**

#### **BUY - SELL**

BURROUGHS All Processors,

Printers Tapes, Disks. Terminals

disto Delivery Computer Equity Organization (303) 825-2041

#### WANTED

OBSOLETE COMPUTER

Top Cash Paid name all types of obsolets as computer aquipment therais. We pay costs for mits as well as too prices

Call today for a q

COMPU-SCRAP, Inc. Randolph, MA 02368 (617) 341-2695 Call Collecti

#### IBM/MEMOREX

stal Con stal Computer sultants Corp. 48 Central St P.O. Bex 1630

#### FOR SALE 30 KVA 3 phase

(DEC)

\$8,500.00 Call for information Carlos Calderon at (301)-423-9101

#### READ ALL ABOUT IT!

- e Closing Prices on New & Used Equip
- e Fair Market Value Data e Computer and Software Training
- Computerworld MARKETPLACE
  - 201-967-1358 508-620-7758 506-620-7750
  - 508-820-7784

#### Configurations ICS-Ask For Jan (800) 268-2233 (714) 838-3717 in Cal

BUY

SYSTEM 38's

All Models

#### DATA GENERAL 4341 - 4381

SUSPEND IEM Buy - Sell - Lease Trade-in Y, SELL, LEASE, TRADE

s Bay Con (408) 866-1020

The Dana Deal. It'll blow you away.

25 ANCELE CA SAN FRANCISCO CA PRODRES AT DRILAS TX DRICAGO E CRUMBUS ON TRANSPORD CT CTC 2-5 and cross 2-5 and cro



One-Stop

ICell (415) 887-310

#### FOR SALE

OR LEASE Save over \$100K

Call Tom at 1-800-331-8283 or in California call 213-306-9343

8055 W. Manchester lays Del Ray, CA 90293

#### BUY. SELL LEASE IBM CPU's

9090 - 400 E, 4381 - PO2 3081 - D. G. K 3089 - 001 Piller Silent Blocks

(214) 783-1212

NEW OR USED IBM PC \* XT \* AT \* PS/2 COMPAQ \* HP \* AT&T \* WANG MACINTOSH \* APPLE 2 1-800-262-6399 **Boston** 

BUY OR SELL



Computer Exchange Corporation MA 617-542-4414

#### digital







Dana

TRIDEX

PHONE 603-886-0383 FAX 603-886-0914

#### **Used Equipment**



BUY · SELL · LEASE

#### **Donate Your Unneeded** Computer Equipment and get a 100% Tax Write Off

e National Vitiligo Foundation needs your help. Donate or unneeded computer equipment to the foundation and sieve its hill value as a tax write off. The foundation in new last the equipment for badly needed funds to help se afficted with this incurable disease. Complete proof

Call Collect 617-784-1999 NATIONAL VITILIGO FOUNDATION, INC.

Sheron, MA 02067

#### THE SILVERLAKE "COMBO LEASE PLAN" FOR SYSTEM/38 OWNERS

V. A Combination Purchase/Leaseback Plan Designed For eed to et perchanno a Silvenske System i compromise. He future vo Sil pr. 33. Lippi in the compet value of upor system and assure a price o COMPUSTA MERCHANTS: New SITE Silvenska Compa Laws Plan.

800-537-6398

MERCHANTS 78-467

FOR SALE FOR SALE BY OWNER Douglas Microdata So Really Pick OS

# Honeywell Level 64

2 tape drives (MTF 0111)
4 disk drives (MSS02420)
1 line printer (PRU 1200)
2 remote printers (PRU 70

3 X 125 MB clink directs 95 ports or N° 1900 2300 tape do 3 channel reloon start musi-channel reloon start musi-45 05C VT220 berms 2 Wyse WY-50 berms Uphau 300 CPS line prints 176-45m LQ printers

9370 CLEARANCE

IF YOU'RE BUYING, WE'RE SELLING

IF YOU'RE SELLING WE'RE BUYING

Due & Sed & Lease PERSONNELLS

(800) 331-8283

[213] 306-9343

Ocean Computers, Inc. 1005 W Marchester Ave. Sin 505 Flana Del Rey. CA 505(5)

EX3

COUNTY.

9375-60 9335-A01 9335-B01

ASKING 75% OF LIST Call Hal Carroll CA 408-241-3677

(800)426-4381

MARKETEX

YSTEMS MODULES PERIPHERALS AX-Q-BUS-UNIBUS AT US OUT TO WOUL OUT TO HEEEDON: Same

#### PRIME

EXPERIENCED SYSTEMS AND PERIPHERALS

NEW PLUG-COMPATIBLE

PLUS THE FASTEST I/O VAILABLE ANYWHERE

#### FOR SALE SPERRY - UNIVAC del 3072-99-1100/60

3M Model 3083-E16

with Peripherals A-221-6/42

P.O. Box 2266 recuse, NY 13220 Call Bill or Lou 1-315-437-7264

You Have 11 Wavs To Advertise Your Products In The MARKETPLACE

#### Featuring:

□ PC Products

☐ Used Equipment

☐ Hardware ☐ Software

Communications Equipment

☐ Rental & Leasing

"☐ Time & Services

□ Supplies ☐ Bids & Proposals

☐ Training ☐ Financial Business Services

Reach over 612,000 information systems professionals by placing your company's mes-sage in Marketplace.

Title: Company: Address City:\_ State I am enclosing ad material with this form

Return this form and advertising material to:

Ad size:

Computerworld Marketplace

375 Cochituate Boad, Box 9171 Framingham, MA 01701-9171

or call a representative today for the details: Midwest: (508) 620-7758

Northeast: (508) 620-7784 West: (508) 620-7759 Fast (201) 967-1358

#### Used Equipment



WANG

Buy e Sell MVP/LVP e OIS VS . PC

n in Inv

VS-8, 65, 85, 100

OIS - 50, 60

GENESIS EQUIPMENT MARKETING GEM

602-277-8230

## - BUY NER - SELL



. NEW EQUIPMEN

001 FUX-015-075-010











FOR SALE IBM 9373-20 M List Price: \$90,200 ale Price: \$65,000 (617) 833-8545 Dan Franck



#### Computerworld's MARKETPLACE section

Looking for a way to reach information sys-tems professionals with your advertising mes-sage? Call a Computerworld product classi-fied sales representative for all the details on the Marketplace sections.

#### (508) 620-7758

(508) 620-7759

(508) 620-7784 (201) 967-1358

# HONEYWELL

#### **HP 3000**

ble in Quant ors o Portpi

BUY . SELL . TRADE MT -I FASE

**ConAm Corporation** It's Performance That Counts 600/643-4954 213/829-2277

#### DEC VAX & PDP 11 BUY-SELL-NEW-USED

ms. Perpherals, Optio available for sale Looking to purchase WAX PDP 11 Systems, Harris

AKEWOOD COMPUTER CORP. 000

IBM...36, 38, 4300, 30XX

**UPGRADES** PRINTERS CONTROLLERS

TAPES DISKS TERMINALS **FEATURES** 

800

• LEASE

#### WILL YOUR COMPANY BE NEXT? REMEMBER

# WE **BOUGHT**

#### By the thousands.

And we still do. Computer Marketplace has bought thousands of IBM Series 1, S.30, 4300, 3000, due and sape drives, printers and other perspherals and we are very interested in offering you top dollar for yours.

We also deal in telecommunications equipm as multiplexors, moderns and port selectors.

Or if you have a need to buy, call us first and BUY DIRECT from the

CDUA

#### COMPUTER MARKETPLACE

800-858-1144

In California dial (714) 735-2103 205 East 9th Street, Corona, CA 91715



PO BOX 71 + 610 BRYAN STREET + OLD HOXORY, TEN

#### Time & Services

#### How to increase vour power

without paying the price.

#### COMPUTING SERVICES

MVS/XA VM/370 DOS/VSE TSO cuce DB2 IMS/DBDC 4GL SAS MULTIPLE CPUs -

50+ MIPS TELENET, TYMNET

DEDICATED SYSTEMS AVAILABLE

ON BROOK & ROSE 312-574-3636

> Call to place your ad today (800) 343-8474

(617) 879-0700

#### Desk Top Publishing

who had LOWER PRICES than we did.

They fold us...
They fold us...
This's because we lead the industry both in price and quality in 1's "s-truck tage drive stably plants to transfer information between mainframes and PCXTIAT, PS2.

etween mainthannes and POXTIAT, PS2.

EBCDICASID Conversion.

Tape backup/robums date storage.

Transfer speeds up to 7 MEGRIAIn.

Cobion to select and reject specific fields

20/1600/25018/1

Drives from Annitou, Cipher, Qualister and M4 Data

Free storhistid sepport.

Data 4 Valums Discount

Real Estate

### Data Center

Available For Rent Clifton, NJ, 1000 sq. ft. Computer Center with separate power and air

Call 201-890-7300

MARKETPLACE

#### Supplies

---

SOFTWARE CONVERSIONS

66 Sultwore Services, Ltd 01 Gulf Pury, Stdg. S-129 Houston, TX 7/023

lt's

NEW! Computerworld

MARKETPLACE

Systems

☐ PC Products

□ Software

☐ Supplies

☐ Used Equipment

☐ Rental & Leasing

☐ Time & Services

☐ Bids & Proposal ☐ Training

CALL NOW

Northeast: (508) 620-7784

Midwest: (508) 620-7758 West: (508) 620-7759

East: (201) 967-1358

#### LASER PRINTERS

LASER PRINTER PRODUCTS 800 521-7968

Inflation Fighters

#### Quality & Savings

nputer Tape Mart 44A Seabre Arenue mityrila, New York 11701 [516] 842-8512

FOR SALE Available 8/1/88

Contact Jerry Gill cleum Merketers, Inc

(804) 288-4127

#### Reach over 612,000 more customers every week in Computerworld's

Marketplace pages.

Computerworld's product classified Marketplace lets you market your products and services to Computerworld's total (ABC-audited) audience of over 612,000 computer

Related editorial for drawing readers Customers are also attracted to Marketplace by articles on computer training and market trends. Plus there's a Closing Prices report on new and used equipment and Fair market Value, a satistical summary from international Data Corporation

Free typesetting and ad creation Choose "display" or "set-solid" formats for your Market-place ad — then let Computerworld create and typeset it for you free of charge.

Telecopier service for fast transmittal Send your ad materials to Computerworld in seconds with our telecopier service. The toll-free number is (800) 343-6474 ext. 739 or 740. In Mass., (508) 620-7739 or 620-7740.

Call your Marketplace sales representative today to reserve your space.

East: Debble Eisenberg, Sales Director (201) 967-1358, Northeast: Paul Bonarrigo, Account Manager (508) 620-778 Mikwest: Mary Campo, Account Manager (508) 620-7758, West: Karrn Missimino, Account Manager (508) 620-7759

MARKETPLACE PAGES

#### Go Shopping in...

Computerworld's
Product Classified
MARKETPLACE

Reach Over 612,000

Information

Systems Professionals!

Call for all the details

Midwest: (508) 620-7758

West: (508) 620-7759 Northeast: (508) 620-7784

East: (201) 967-1358

#### Communications Equipment



Create Powerful, Dependable, Cost-Effective Voice Systems.

DIALOG/4x Multi-Line Voice Communication System

You can design PC-based call processing systems, quickly, reliably and at low cost with Dialogic voice 1/O products. Our four line DIALOG/ax card and MS-DOS device driver have become the <u>defacto</u> voice industry standard.

For more information on the complete Dialogic voice product family, please contact us at:

#### Dialogic Corporation 129 Littleton Road

Parsippany, N.J. 07054 Phone: (201) 334-8450 Fax: (201) 334-1257 罪

#### Rental & Leasing



800-243-5307 In CT (203) 661-4200

ystem 38's to 3090's and everything in betw

Randolph ......

# COMPUTERWORLD Training Sections

Turn to the Training section of COMPUTERWORLD's issues for an interesting editorial feature addressing these and other questions.

- 7/18 Getting the most out of software vendors
- 8/1 Controlling managements unrealistic expectations
- 8/15 Interactive videodisc
- 8/29 Cost-benefit analysis for training
- 9/12 On-line computer-based training
- 9/28 Teaching end users how to trouble-shoot problems

Call for more information 617-620-7794

BURROUGHS UNISYS

A Series - V Series

Al Perpherais

Low Loans Rates

Depot Maintenance COMPUTER PROVISION CORPORATION 800-832-4664

Programmer Tools

FREE BUYER'S GUID

then you need programmer's development took programmer's Commission and best one-stop source. We are an adequated discontinuous temperature program an 200 manufacturing with one 600 m

Programmer's Connection
7249 Whopits Are NW
Men in Carono (Mine 4472)
800-336-1166 US
800-225-1166 Carono
275-494-3781 AK & OH (Called
275-494-3781 AK & OH (Called
275-494-3781)
106-984-3781
106-984-3781
106-984-3781
106-984-3781

VAX RENTALS

MICROVAX II VAX 700 SERIES VAX 8000 SERIES

Systems & Peripher

• Feet Turneround

• Dependable Products

• Usorade/Add-On Fleetbille

BROOKVALE ASSOCIATE
ctb Digital Destrict Association

DEC

call:713 445-0002

Computerworld's MARKETPLACE

ooking for a way to reach is present systems profession is with your advartising meage? Call a Computerworl roduct classified sales report practive for all the details on new Marketpiace section [508] 829-7758, 7784, (201) 987-1358

# "We're advertising all our services to numerous diverse groups. And we're reaching them all through Computerworld."



Realistically, Leasametric Data Communications of Foster City. California, is many companies rolled into one. Along with being a major equipment-rental company. the 25-year-old Leasametric also leases, maintains and sells person al computers, peripherals and

With so much going on in one place, it's no surprise that Senior Vice President/General Manager Crista Martyr has a lot to think about. Not the least of which is

"We're out to reach a broad base of customers in Fortune 1000 busi nesses. Over the last year we set out to position the company as a



the perfect choice for one-stop shopping

"If we want to effectively promote ourselves as being all things to MIS/DP and communications protessionals, we need a vehicle that takes the same approach. That's why we advertise in Computer

"Computerworld is read by MIS managers. PC users and communi cations professionals. We're advertising all our services to numerous diverse groups. And we're reaching them all through Cemputerworld.

this. Computerworld has been our primary vehicle for three and a half years, in fact, it's to the point



now where we reevaluate all our advertising vehicles every year — all but Computerworld. That's one that's never in auestion

"We're very pleased with Compu-terworld. Every time we run an Apple campaign, for example, the phones ring off the hook. It's won-

Computerworld. We're helping more suppliers reach more customers more often in the info tion systems market. Every ek. We're working for Leasametric, and we can work for you For all the facts, call your local Computerworld sales repre-

7/Weshington D.C. (703) 280-iomite (404) 394-0758/ > (312) 827-4433/Dellios (214) //Loc Angeles (714) 261-1230/ scisco (415) 347-0555



#### COMPUTERWORLD

PROCED, Paraman Place 1, 140 Proces 17 North, remain, NJ 07652 (201) 987-1350 CW PUBLISH

Pritz Landonnoville Company
Pritz Company
Pr

CONSTITUTE Van President Agenties Anderstelle State States States

of Chromites Minagement, Manners Date, Chronic of Chromites Proceeds, Jose by ICTOR Production Descript, (agt) research, Austrian Production Descript, Carel Found Production, Descript Holf, Art Director, Torr Manufact.

A proposal page (C) Communication (L) A plant (L) A pl

1 230 effs. Teles: (801) 22 6507 (200 Hz.

Sub- Asin-Louis Resire. Computer Publishing Group S.R.L.,
Vin Velle 7, 20127 fellows. Early. Proces: (011) 26-2

2013432 Teles: (943) 225318,

3 rets called Teles (1985) 240-4217 (Computational Sign origi.
In Notember DC Communications, Japan, c/o bilgeon in in Notember DC Communications, Japan, c/o bilgeon in investment, bill control of the control of the consensations, billion (2011) (279-1279-1279) (3-12 to less plantations, billion (2011) (279-1279-1279) (3-12) (4

IDG COMMUNICATIONS/INC.

Part A Million Communication Client Street, S

test or deposits and interestings from		
of Asperties ASA'S Commencedory		
THE PERSON NAMED OF		
parent function that I fund		
Personal December & Company		
MAT'S Computerwald SZT, PC Hillands		
age & Company Black, SSF Hard		
HEROTT Computerwell House, PC.		
MALVOT Comparages for Justice		
Computerwell Calls Computerwell I		
of food It's their form Brant Com		
New House Surector's Computer Sta		
America, CRA, Companier Commanda, Commanda		
relies, selection, Standard Today, St.		
on Hotel PC Latter, PC Hotel Parada		
MAN WEST COMMENT'S Computerwest		

### ADVERTISERS INDEX

D Strate 17	Advanced Computer	Intern
D Route 17	Advanced Computer Environments35	
MA 51701-	Al Corp73	LDI D
	Alcatel Business Systems 74.75	
375 Cody-		McCe
	Arthur Anderseq66	Merid
MA 01701	B.I. Moyte & Associates23	Metas
	BMC Software30	More
617) 675-	Candle Corporation	MSA.
(617) 876-	CFS-Desco	MARS-
CES:	. Chicago Soft	HCR.
MA 01701-	CNI/Cor SCA	MEC
	Cincom Systems24	Notec
Matter, Pa-	Computer Computer	Hoter
	Culinat Software34,50-51	Corni
G12 527		
		Oracle
CA 92714	CW Marketplace S10 CW Testimonial 94	Porete
	CW Instruction 94	Provid
22081 (703)	Data General31	Reeds
	Data Processing Security	Redati
The same	Deteguerd	
879-0700	Duqueene Systems	SAS I
		Softw
TOWNSON, MA	El Carrino Resources Ltd	Street
	ENC Corp	Stretu
CA 94303		Synce
	Pischer International68	Tonde
	Goal Systems10	TRS S
	Goldman Sechs	Tolové
171		Texas
	Howlett Packard	Union
E Hadey	IBM	VM So
r. Am Dell.	Information Resources 22 Information Builders 59	West
	Innovation Data Processing	
	Integrated Systems Management	Xeres
	Caballana Systems management	-

.44	International Power Machine	513
35	LDI Disaster Recovery Corp	***
.73	Leasametric	
-75		
.32	McCermock & Dodge	61
.66	McWinter Chatens, Inc.	54
	Meridian Group	
.30		
30	Micro Fecus	
-15	MSA	C4
	Multi-Tech Systems	43
.57		
37 SC4	HCR	62-63
24		C3
743	NEC	20,53
48	Notwork Equipment Corp./ ComDesign	
-61	Novel	46-47
36		
SC3	Oracle	11
10		
.94	Perelen	64
	Provident Recovery Systems	58
.31	Reals	-
512	Probability of Ton Control of the Co	······································
.52		
510	SAS Institute	2.13 57
-27	Software Engineering of Ameri	9
52		
.54		
.57	Sundard	
	Syncocrt	3
.68	4	
	Tendem Computers	
10	TBS Software	47
42	1007000	
39	Texas inspurients	29
56	Union	20.21
	Tolevideo Texas Insirurents Lideys Wil Software Wyse Technology Xeron	
759	VM Software	7
22		-
59	wyse recruicing/	71
5	Xerra	60
25	Zenith Deta Systems	65



## Upcoming Computerworld Spotlight Sections

•		
Issue Date	Topic	Ad Closing Dat
Aug. 8	IBM Midrange Software	
	(System 3/X)	July 22
Aug. 29	D82 Market	Aug. 12
Sept. 19	Hardware Roundup:	
	Large, Medium Scale and	
	Special Purpose Systems	Sept. 2
Sept. 26	Hardware Roundup:	mp. s
	Small Scale Systems	Sept. 9
Oct. 3	Hardware Roundup:	order s
	Personal Computers and	
	Workstations	Sept. 16
Oct. 17	Al/Expert Systems	Sept. 30
Oct. 31	Unix	Oct. 14
Nov. 14	TRA	Oct. 28
Dec. 5	LAN's	Nov. 18
Dec. 19	· IBM-Compatible PCs/PS2	1404. 10
	Market Products/Monitors	Dec 2

# NEWS STOCK TRADING INDEX 103.5 103.6 103.6 104.4 106.1 72.9 86.1 130.3 102.2 113.9 103.8 103.3 75.0 84.4 124.0 Composite Index S&P 500 Index 93.8 113.5 257 71 10 25 4 4 10 25 27 27 27 20 25 27 27 26 10 25 27 27 27 26 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 27 28 10 27 27 28 10 27 27 28 10 27 27 28 10 27 27 28 10 27 27 28 10 27 27 28 10 27 27 28 10 27 27 28 10 27 27 28 10 27 27 28 10 27 27 28 10 27 27 28 10 27 27 28 10 27 28 10 27 27 28 10 27 28 10 27 27 28 10 27 28 10 27 28 10 27 28 10 27 28 10 27 28 10 27 28 10 27 28 10 27 28 10 28 1 ORNERS NO BOOD BURNESS \*\*\*\*\*

#### Computerworld Stock Trading Summary 16.00 16.13 7.00 10.75 1 411011111 RESERVED BER 27 8081









282829

# The Street displays firewor that turn out to be duds

Sen'inegarage age age age age 33636436768646311-3-61566 4-3-66-64791-3218186 

7日は大日の日には 日本日の日の大日日日

ne Dor Jones Industrial strenge did nimitale join dimitating independence ferrencies, exploding trigibly early is officed to the property of the control of 1,986.0 bit fining such mixing such the flour deep leastness nevel dever on. A compact leaves; in such a such more SMV for the words after the firm amount of the compact leaves; in such as and now SMV for the words after the firm amount of the compact leaves; in such as and 10% forest story page 4. 10% forest story page 4. 10% pages to story page 5. 10% pages to story page 5. 10% pages to story page 5. 10% pages to story page 6. 10% pages 10% pages 10% pages 10% page 10% pages 10% page

points to 85%; Ashton-Tate Lorp, opint to 85; and Control Data Corp, of a point to 26%. Wenners included Crnearch, Inc., up 1% points to 85%; IB one point to 127%; Microsoft Corp, jk of a point to 68%; Digital Equiport, or point to 14%; and It-Packard Co., up % of a point to 14%; and It-Packard Co., up % of a point to 155%.



SYNKE

# Wheeling and dealing on PCs

Buyers indulge in discounts as vendors, dealers feel pressure large Midwestern Fortune 100 corporation, buyers negotiate such large discounts that some

BY ALAN J. RYAN

If you're paying list prices for personal computers these days, save yourself some embarrass-ment and keep that information

Standard discounts from ven-dors and the pressure for dealers to compete with direct sales are giving buyers the upper hand. When they have time enough to he choosy, their sttitude is often, "Big discounts, or the deal is

off."

According to buyers inter-viewed hast week who all place orders for 100 or more micro-computers annually, discounts are no longer as inferequent and unexpected hunny.

Some buyers said they work directly with several wendons to obtain the lowest price for con-parable technology without hav-ing to deal with the middleman get to deal with the middleman.

Fracas

FROM PAGE 1

retailer. All agreed that rarely, if ever, would they pay full retail price for any hardware. Figuring in a standard 34% discount, IBM's \$7,995 Person-al System/2 Model 70-121 would he available to many buy-ers for \$5,277, and the \$2,139 PS/2 Model 25-L01 would sell for slightly more than \$1,400.

such large discounts that nome vendors back out because the profit margins are too low. But with his company buying more than 200 FCs monthly, he said most vendors find it hard to say no, even when his company requests 40% discounts.

To qualify for high discounts, a communing measure at a Rast a communing measure at a Rast to quanty for high discounts, a computing manager at an East-Coast financial institution eaid his company mast place orders for more than 1,500 computers annually. Through a deal with IBM, he said, he receives a 34% discount Cutting deats
While the discounts buyers receive generally vary from 26% to 35% at most of the companies contacted, some said they prefer contacted, some said they prefer fixed rates over variable ones. One buyer said, "We try to find a dealer who will give us a flat dis-count across all of the hardware rather than working out dis-counts on a piece-by-piece ba-sis." The added stability makes it easier to predict computer Not surprisingly, the larger e vendor is, the larger the dis-sunt is likely to be. Although ount is niety to be. Atthough one companies can negotiate ercentage discounts with IBM and range from the high 20s to id-30s, some smaller vendors. Her almost no price break at all. For example, one company

dgeting. At times, according to a buyer the company headquarters of a

Codd, who, along with IBM, made SQL and adherence to Codd's so-called relational model

potential reversal in today'a market, in which Dbase has held a near monopoly for the last sev-eral years. Up usell now, firms hawking what some call better products battled for the crumbs brushed saide after Ashton-DBMS market.
The strides SQL has made even forced Alahton-Tate to acramble for partners such as Sybase, which provides the SQL Server that Alahton-Tate will market, and Wordstech Systems, Inc., which sold SQL language technology to Alahton-Tate and provided a nearly complete develonment team.

Clearly, this is a war that has yet to really begin. In fact, Ash-ton-Tate's share of the retail

has struggled to understand what SQL is and what it does, ap-pears ready to make some deci-

ton-1806 a share of the retail market has increased in the past year, according to IMS America Ltd. However, a recent Focus Research, Inc. survey of large corporations found that plans to buy Dhase are off noticeably (see sions. Some have already decided what product will replace Brane. Earl Most, manager of advanced manufacturing and engineering systems at Hawerth, Inc., is moving his users from Doase to Oracle on PCs and is now training people in SQL programming. For others, the decision will take longer, Whirlpool Corp. will choose its fature PC DBMS placeform based on how well it fits Fhank Codd
But the evolution of PC DBMS
technology, much of which has a
clear mainfrance heritage, has
unhered a host of new and poten-

contacted said it is buying Dell Computer Corp. PCs. While the comparate Corp. T.c. wase the corporate discount in very small at just 5%, he said, "one advantage in that they will ship Amdelt monitors with the computers for us," which Dell does not normally by do. And, according to nancher manager who is also considering Dell, the computers are lower priced than their competition to heein with.

npanies that nit to buying Many large companies that are unable to commit to buying are unable to commit to buying large quantities of computers inmally—and those that buy as flactuating demand is generated—funnel their buying dollars through local retailers and are offered significant discounts for doing so. Most said discounts ranged from 26% to 37%.

First dibs Cheryl Currid, ma nation, manager of de-remental computing at Coca-la Foods in Houston, said her mpany's microcomputer the said she is sometimes forced to buy from other dealers that do not offer each attractive discounts. When buying one model of Compaq Computer Corp.'s Designo 386, she said she has seen as much as a \$400-per-PC difference in prices through local

counts on barefever through the local branches of two national retail claims. We deal where we get the best buy, "he said of in company's amusal purchases of some 100 to 200 BM PS/2s and Compan and Toshiba Corp. PCs. As with assay other buyers, Helier negotiates for the entire with retailers, but the contract of the property of the nes right away,

The data base joust
Ashton-Tate's and Oracle's day
management system products

ed as the sole major vendors offering PC-based data be

nee III Plus; no SQL s

nor technical analyst for the ap-plance maker. It may take as long as two years, however, to choose a supplier. "We are still not super-firm on our mainfrance

data base, "Mets said.
Despite the infusion of new and innovative competitors, many remain Dhase diclards.
"The only thing I see in SQL being added to the Dhase Ina-guage," and Adam Green, a teacher of Dhase at Digital Con-sulting, Inc. in Androver, Mass. But for Green, it in the Dhase Inaguage and not necessarily the Anton-Tate product that will continue to predict that will

Sticking with Diseas

Some users agree with Green. "I
am expecting that Disea IV will
astisfy our needs," said R. Bruce
Johnson, manager of the PC Re-source Center at Delotte Has-tists & Sells. "I have beard no rumblings about deserting the

ns & Sells. 's new motings about deserting the base standard.'
Touche Rose & Co., traditionly a Disse shop, said it is undesided as to its next move. The — of consider a variety of

Douge IV is clearly still in the running.
"You ignore the market lead-ret your own Berta!" said G, left rey Knepper, director of advanced technology-tars at the By associated that its embrace of Consideration of SEL will knep competitions of SEL will knep competitions of SEL will knep competitions with the said of SEL will knep competitions with the said of SEL will knep competitions with the said of the martial said of SEL will knep competition with the said of the martial said of SEL will knep competition with the said of the martial said of SEL will knep competition with the said of the said of SEL will knep competition with the said of SEL will knep competit

president. Irosically for many shops, mainframe software accessed via PCs as the best alternative to PC DBMS products.
"Everyone is tied into the mainframe, and they tend to use that," said C. Thomas Hendrix, manager of information services at the Alument Company of

tially successful players into the market. Many of these players offer products that would tickle the fancy of the infamous Edgar

Mans. 01701-0171.

Copyright 1980 by CTR Maching-line. All rights reserved.

The copyright 1980 by CTR Maching-line 1980 by CTR Maching-line. Or Berrise and other sector registers with an 42 300 per copyr of the article, plan 8.30 per page to paid dire.

Mans. 01778.

STMASTER: Seed Perm 3879 (Change of A JULY 11, 1988

#### TRENDS

### Tape storage



technology, but red-tored tape drives are so entrenched that their replacement by cartridge drives has been less han revolutionary. Half-iach cartridges will overtake roel-to-red his year — but just barrely, according to Freeman Associates, Inc.

Inc.

Cartridge shipments will increase steadily into the early 1990s. in 1992, Freeman predicted, 49 times an many cartridges as reel tapes will ship.

"A lot of users are locked up into reel drives," Freeman Vice-President Bod Abraham said. He added that it is "such a slow, and the said of t

into reel drives, "Freeman Vice-President Bob Abraham said. He added that it is "such a slow, painful process" to convert information from one medium to the other that most MIS manageers will stop, newer information on cartridge drives and wait until the information on the reel-toreel drives becomes obsolete.

While revenues from reel-toreel drives are slightly greater than those of cartridges this year — \$808 million compared with \$655 million — cartridge revenues will outstrip reel tape revenues by \$400 million in 1990 and by \$1 billion in 1992, the firm

forceast:
Cartridge drives on the low end of the market — those with data transfer rates lower than 1.5M bytelser. — currently account for three times the sales of faster drives. Sales will containe to grow, Freeman isad, and the low-end drives will account for more than four times as many adaptments as the high-end cartridges.

ridge offerings in the midange, Abraham noted. Total carridge drives

Reel dollars dive; cartridges make splash



MATION PROVIDED BY PRESIDEN ASSOCIATES, INC.

INSIDEL

Time for this transaction. DEC will report ofly make: it support of the debit-reddit benchmark a contemperate of non-line transaction processing amountenants in New York 19/1 19. DEC could make public debit-reddit benchmarking reducing the support of the contemperate of the country about with enhancements to lar relational data base product and with enhancements to lar relational data base province. EDB. Also company could be a data base surver carrying the

1 N

The big a SIACV Industry contributed above DEC dubries, BAD projects contained the work with specialism that the company has billed its seg-sized from project, a 64-bit recompany, has billed its seg-sized from project, a 64-bit recompany has billed its seg-sized from project, a 64-bit recompany from the company from the company

Chaemiel blocked up. The first microcomputer computble with IBM's PS/2 has been delayed. Officials at Tandy and its Intel 80386-hased Tandy 5000 MC will ship in one reek — 10 to 15 days later than originally scheduled. Be tige, Tandy's director of product development, mid shipment delays of major components' caused the slips in the

Buy petroleum stocked The survey canc in The Consideration in the only one the final who leves that the final real is a plantic. Team instruments, the corebory who supply totherwise plant on them. The consideration of t

If-3-me-teel Primedire (Edges may worry short "Shr War," but Tandem (EO) Jim Treybig says his firm has its world life of the "I the property of the says of the world life for it.— they believe is K-mail," he says. "Some one taken a stand on an issue that is goldical, then you develop a but the between opposing views," Treybig says Tandem on the says of the says of the says of the says of the her does in both to reficus its devictories mail addicts back to designing and selling transaction processing computers but E-mail wars all break out "says be once a year."

Uniquies the hunte. IRM informed by figures the manches ago that it is repressing the first of 1 few-stage interest across and its in expensing the first of 1 few-stage interest duction of distributed data less product. The amounts must wan distributed data less product. The amounts of the stage of the stage of the product of the prod

rea to de the first party and seek on a some ornaer of a state of the state or result of measured the best prime at grown in providing problems for the designant on arthuring of antivirual measures. The Compater Virus Industry Americanius Youngame 1 to 1 intell the agreed of measuring framework and destruction of inefficiency produced for the state of th

98

# OUR NEW PRINTERS MAKE EVEN BAD WRITING LOOK GOOD.

CHAPTER ONE
THE BLACKEST HOUR IS MIDNIGHT

It was not a night fit for man or beast what with the sky being as black as ink and it starting to rain like cats and dogs. As if things weren't bad enough leffrey whipple had to climb all the way up to the top of haid Regie hill in his anakeskin boots so new their small remained him of a car he once leased in Flagstaff, Arizons just to check things out because earlier in the day a massage had gotten through that there was going to be trouble this night so he was feeling contours as the dry wind whipped up the dust around his feet and wondering if he should go on or go back to camp when suddenly, he heard a twig crack behind his or thought he did but as he turned he

We're sorry that our new 24-wire Pinwriter P5200 and P5300 printers can't do much for the quality of your writing. But they can certainly do wonders for the way it looks. The secret is the ribbon. Other for matrix printers only use a fabric ribbon. Our Pinwriters print with both a fabric and a letter-quality, multi-strike film ribbon—the same kind used on executive typewriters.

The NEC Pinvriters can also enhance your writing in other ways. They have seven resident yope styles. Plus four more are available on plug-in font cards. Which means you can express your thoughts with just the right typeface. You can also get an inexpensive, user-installed color option. And if graphics are part of your story, these Pinvriters produce the highest resolution of any printer you can buy.

Call NEC Information Systems at 1-800-343-4418 to see how much better our new Pinwriter P5200 and the wider P5300 can make your writing look.

Whether you're a budding
Hemingway, or a
Hemingway & Company.

NEC PRINTERS THEY ONLY STOP WHEN YOU WANT THEM TO

NEC



EC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719

WE HELP ALLEH BRADLEY MONE OLIVLITY PRODUCTS.



Casely a die 1985, if a leader in the world of factory automation, no company symbolisms quality file. Alter-Brackey is, white software does the leading manufacturer of factory automation dequipment use to manage their Driver Software production process? The sawer is ALMS software from

Management Science America, Inc.

With products the require contomization, and market petitives that dictible continuity shorter lead times, Allen-Buckly needs precise scheduling to make sure they have the light invention on hard to make customer demand. Now, exceeding to bean Hoffmann, Manager of Hoduction & Inventory Control for Allen-Buckley Dorles Devictor, "AMAPS has given us the shally and marrie to control one modification and marrie to control one modification and married to the shall be a second on the control of the second control of

In the first six months of 1967 elong, Altan-Bradley's Drives Division has out 90 million in inventory and has improved inventory turns in 96 of the lest 95 months. While refuting inventory they're increased on-time shipments to over 97%. According to Jim Hert Division Commiter "ANAPS" save us the totals to implement our

business plan and enable us to reduce inventories and better serve our Customers."

MSA software can help you be a leader in your inclusing for more information, call flobert.

MEA The Settlement